"Blame it on the Brain": Exploring ADHD as a Criminogenic Factor.

Introduction

An interesting report published by the ADHD foundation[1] recently made news in the Guardian with the title 'One in four UK prisoners has Attention Deficit Hyperactivity Disorder, says report'.[2] Dr Tony Lloyd, chief executive of the ADHD Foundation, was quoted in the article as stating, "People with ADHD don't have a criminal gene. They aren't more likely to become criminals".[1,2] If this is the case- if ADHD isn't truly a direct lead to crime- then how can one explain the incredibly stark increase in prevalence (an estimated 5-10 times that of the public)[1] among the incarcerated population?

Attention Deficit Hyperactivity Disorder (ADHD) is a neurodevelopmental disorder characterised in the ICD-11 by inattentive, hyperactive, and impulsive behaviours.[3] Due to these characteristic traits, it is perhaps unsurprising that the prevalence of ADHD in those incarcerated vastly outweighs that of the public. Among those in custody, up to 30.1% of young people were found to have ADHD (five times that of the general population), and this escalates to a tenfold increase in prevalence among imprisoned adults (26.2%),[4] suggesting there may be a link between the condition and antisocial behaviour, but is enough being done to address this?

At the centre of medical ethics lies the pillar of justice[5] and so it is the duty of the psychiatrist to explore this topic further to see if the management of ADHD, as well as subclinical presentations, could help reduce rates of recidivism and future antisocial behaviour in ADHD youth. It has been shown that 70% of patients respond to treatment (at least in the short term),[6] and so perhaps identifying and treating ADHD could be a starting point in reducing offending behaviour across the population.

The condition at hand: does ADHD increase the chances of offending behaviour?

Many contributing factors to offending behaviour in patients with ADHD will be explored throughout this essay. Evidence hints that different ADHD presentations may result in different patterns of criminal activity, with individuals with predominantly impulsive presentations showing the highest rates of crime overall.[7] The crimes that tended to be committed by this subset seemed to consist of naturally impulsive crimes such as robbery and basic theft, which contrasted with predominantly inattentive patients with ADHD, who tended to engage in more premeditated crimes such as burglary and drug dealing.[7] This begins to convey the idea that it could be the ADHD symptoms themselves that have a role in leading to this antisocial behaviour.

Outside of the diagnostic criteria, it is well-observed that cognitively, patients with ADHD often have additional deficits (including executive dysfunction and emotional dysregulation), and it could be posed that these can be a contributor to their susceptibility to offending. One of these deficits is executive dysfunction, which is thought to be linked to the dorsolateral prefrontal cortex (PFC) and results in a range of impaired cognitive functions, including working memory, organisation, behavioural inhibition, time-awareness and motor planning.[8]

Interestingly, reduced activation of the PFC and striatum seems to be a neurological biomarker of ADHD,[9] with the condition being linked to genetic decreases of catecholamine signalling responsible for the maturation of the PFC.[10] Those with executive dysfunction are also predisposed to

impairment of processing long-term consequences[11] and delayed reward,[12] which may explain the seeming thoughtlessness behind impulsive crime when combined with behavioural disinhibition.[13]

Another aspect of function controlled by the PFC is emotional regulation, which may also play a big part in contributing to violent behaviour. It has been argued that emotional issues should be added to the diagnostic criteria of ADHD.[14] Regarding violence, studies have shown that patients with lesions in the ventromedial PFC are more likely to resort to threats and intimidation in the face of dissension[15] and a study by Tager et al. (2010) suggested that men with maladaptive emotional regulation were more likely to have engaged in intimate partner violence (IPV).[16]

Research on children with ADHD has been consistent in implying deficits in cognitive empathy (the ability to predict and appreciate others' emotional responses),[17] something that has been shown to have strong links with the risk of offending.[18] This is compounded by the correlation of ADHD with Dissocial Personality Disorder and Conduct disorder,[19] particularly with the presence of callous emotional traits in ADHD predicting the development of the former.

However, this does not indicate an absence of morals in those with executive dysfunction- evidence suggests violence linked to these cognitive deficits tends to be reactive rather than spontaneous.[20] Patients with ADHD have also been shown to have often a justice sensitivity (a strong emotional response to sensing unfairness in a situation),[21] implying an intact sense of right from wrong. Regarding empathy, research has demonstrated intelligence and education to mitigate the deficits. Research also suggests that the decrease in inattentive symptoms that comes with treatment with the first line of psychostimulants such as methylphenidate increases affective empathy in children with ADHD[22,23] a recent study by Fantozzi et al. (2021) showed, unfortunately, the same could not be said for cognitive empathy.[24]

Is it just ADHD? The impact of trauma on offending outcomes

Using the evidence provided above, it would be dishonest to suggest that ADHD is the sole reason for offending behaviour in these patients. After all, not all people who have untreated ADHD commit crimes, so it is not a stretch to suggest there may be other factors at play.

It is widely accepted that trauma commonly contributes to difficulty forming attachments to others.[25] In 2005, J. Ford suggested that early trauma moves the brain from 'learning mode to survival mode'.[26] Trauma is often multifaceted and repetitive throughout an affected child's life and can be composed of neglect, physical, sexual, and emotional abuse, and simply witnessing others face these issues.[27] Violence and abuse can significantly impact children's offending behaviour; a good example is firesetting (a behaviour well-associated with ADHD).[28] Kolko and Vernberg's 'Assessment and intervention with children and adolescents who misuse fire' states that removing a child from their toxic home environment often causes firesetting behaviour to cease altogether.[28]

Adverse childhood experiences (ACEs) are known to have detrimental impacts on a child's long-term health and social wellbeing[29]- one 2013 study (Reavis 2013) showed that convicted adults were four times more likely to have four or more ACEs than the general population.[30] While the study was limited by reliance on self-reporting, its results align well with other literature; Whitfield et al.'s (2003) found that boys who experienced abuse (or witnessed IPV in childhood) were more likely to engage in IPV as adults.[31] The genetic inheritability of ADHD [14] creates an understandable generational cycle of trauma and maladaptive behaviours.

But what is the causal link between early trauma and these maladaptive behaviours? Unfortunately, children with higher volumes of ACEs tend to have suffered attachment difficulties, another

recognised criminogenic risk factor. Returning to the example of firesetting, children who set fires are likelier to do so during the day, as opposed to the secretive night-based activity seen in adult fire-setters.[28] Kolko and Vernberg, therefore, suggested that this is instead due to attachment-seeking,[28] so perhaps addressing this root cause is the key to preventing similar behaviours in other children.

As a natural part of ADHD is inattention,[3] it is unsurprising that many children with the condition struggle in school.[8] Difficulties in educational experiences before age eight are known to cause decreased academic engagement later in life.[8] This helps explain the increased suspension rate from school children with ADHD face.[32] The strong association between school suspension and later offending behaviour[33] makes It easy to see that educational difficulties are yet another contributing factor to these problems.

With all these adversities children with ADHD experience from a young age, decreased self-esteem seems like a natural consequence. In one 2013 study, it was found that those with ADHD showed over five times as much poor self-esteem, both with and without treatment.[34] As summarised in 'Forensic Child and Adolescent Mental Health', this could indicate that children with ADHD are likelier to (due to poor self-worth) exaggerate their role in a crime,[11] particularly since ADHD was shown to be a risk factor for false confessions in a large 2012 study of Icelandic youth.[35] Collateral damage from this low self-esteem is that people with ADHD show high levels of rejection sensitivity,[21] often unofficially termed 'Rejection Sensitive Dysphoria' (RSD)[36] and associated with the emotional dysregulation[36] people with ADHD face. Rejection sensitivity often presents itself as aggression in people with ADHD,[21] and as previously mentioned, this emotional dysregulation is linked to future offending.[16]

This fear of rejection is unfortunately not unfounded as children with ADHD are also known to face higher levels of rejection from peers (including lower rates of reciprocal friendships)[37] a fact well associated with higher levels of offending behaviour.[38] Rejection from peers can also lead to children associating with other youths with maladaptive behaviours.[38] Rejected children are known to be very susceptible to peer pressure[8] and so with the combination of poor impulse control[11] and low self-esteem[34] one could argue that encouragement from others could play a big part in many crimes committed by people with ADHD with the links between deviant peers and offending behaviour.[38] While this does not absolve them of culpability, it is at least a potential explanation to consider when attempting to rehabilitate offenders with the condition.

Another often ignored contributor to the conversation is that of gender. ADHD is accepted as being often missed in young girls.[39] As previously mentioned, the poor self-esteem often seen among children with ADHD[34] contributes significantly to offending behaviour, and this is even more significant in girls. One study showed that rates of recidivism among girls were significantly reduced with therapeutic targeting of poor self-esteem, where it was an issue.[40]

All these contributing factors make it clear that a trauma-informed, individualised treatment plan could potentially ameliorate outcomes- it is not simply the ADHD causing offending, but a variety of biopsychosocial elements colluding to create maladaptive learned behaviour.

Hiding the true cause: ADHD and Comorbidity

Another factor considered by the catalytic report is a substantially high incidence of psychiatric comorbidity in prisoners with ADHD- up to 96%.[1] This figure is, of course, much greater than the prevalence seen in the general prison population, with the most frequent comorbidities including substance use disorder, conduct disorder, and personality disorders.[1] In treating the underlying

ADHD that may be overshadowed, could the reduced complexity of these patients result in better forensic outcomes?

Conduct Disorder (CD) is particularly noted to frequently occur alongside ADHD.[1] Evidence suggests that comorbid ADHD and CD may propose a higher risk of offending behaviour[11] as their combined presence is often an indication of the severity of each condition.[19] Bivariate genetic analyses of twins demonstrated that the genetic risk of conduct issues is explained by the genetic factors also linked to ADHD, which is reflected by shared familial histories of cooccurrence.[19] A systematic literature review found that comorbid CD and ADHD were the true predictor of criminality rather than ADHD alone,[41] and so it is possible to see that the issues regarding ADHD and crime are more complex than they may seem.

CD is recognised to be a precursor to dissocial (antisocial) personality disorder, with callous-unemotional traits being associated with future 'psychopathic' tendencies.[42] Research also suggests that ADHD could predict adolescent psychopathy, particularly in girls.[43] One study showed that ADHD only seemed to act as an independent contributor in girls and that only in girls were the interpersonal aspects of psychopathy related to the presence of ADHD.[43] The study did suggest, however, that the heightened risk of psychopathy in girls was related more to the presence of CD symptoms rather than ADHD,[43] with some studies sometimes concluding ADHD alone was not correlated to dissocial personality disorder.[41] Still, it is easy to see how the indirect link between ADHD and this set of chronic antisocial behaviours can add to the complexity of individual cases for clinicians to manage. Overall, a 2013 review of broader literature still showed that with or without a current diagnosis of CD, children with ADHD were more susceptible to developing dissocial personality disorder later in life.[41]

Otherwise, ADHD is associated with an increased generalised prevalence of all psychiatric cooccurrence (including autism, psychosis, mood and anxiety disorders etc.)[1] This means that the potential should be considered that it may be the presence of other conditions that precipitate offending.

As mentioned in the report, one example is that substance use disorder (SUD) is quite common in offenders with ADHD.[1] When combined with the high rates of CD in this group, it is understandable how there is an increased risk of offending behaviour; the heightened risk of violence in those with SUD is long established.[44] However, for people with ADHD, perhaps due to barriers to medication, illicit substances such as cocaine and cannabis are frequently used to self-medicate.[45] This means that for people with ADHD, the reason for their offence could be simply born from a desire to relieve their struggles. Often the victims of criminal behaviour are the offenders themselves, with accidental death being a common cause of premature death in individuals with ADHD[46] and being well-associated with alcohol use- particularly when it worsens impulsivity and inattention.

A repeating pattern: ADHD and recidivism

In the UK, the minimum age of criminal responsibility is ten years old. This is lower than most countries globally, particularly other western countries with otherwise similar societal norms. In an article comparing public responses between the tragic murders of Jamie Bulger in the UK and Silje Redergård in Norway, David A. Green summarised the sensationalist media response, public outrage, and the revelation of the offenders' names in the UK. In Norway, however, outcry was subdued once the ages of the offenders were revealed, with media coverage centring on professional opinions on facilitating the reintegration of the boys into society with no formal punishment (a view spurned by the UK).[47]

It could be theorised that the staunch variation in these responses can be attributed to differing values regarding crime, punishment, and rehabilitation. A review of a 2013 public survey on crime showed the British public values punishment heavily, often overestimating the severity of sentences offenders receive. It also showed that being born in the UK resulted in stronger punitive views (valuing punishment over rehabilitation).[48]

Despite evidence that rehabilitation can reduce recidivism rates, firesetting (as established, a crime linked to ADHD) is known to receive particularly harsh sentencing.[28] In this essay, it has been previously discussed that people with ADHD due to executive dysfunction can have a delayed perception of consequences,[13] and so it is logical that rates of recidivism would remain disproportionately higher than the general population (as is seen to be the case in the Takeda report[1]).

But how do offenders with ADHD fare once incarcerated? While structure and routine can be a beneficial addition to the lives of those with ADHD,[49] prisoners with ADHD are more likely to engage in harmful behaviours while imprisoned. [11] In combination with the high rates of recidivism, there is an argument to be made that there is little reasoned purpose in simply punishing these offenders other than to keep the public safe from those at high risk of offending.

These high rates of recidivism are also seen when it comes to risky driving.[50] Road traffic accidents are a high cause of mortality in people with ADHD,[46] and research has shown that those who'd had a diagnosis of ADHD as a child (including those now below diagnostic thresholds) are more likely to repeatedly take risks while driving despite consequence[50]- a considerable public safety risk.

But what can be done if people with ADHD seem to be at higher risk of reoffending regardless? As previously mentioned, focussing on improving self-esteem has been shown to reduce recidivism in girls,[40] but interestingly this only works if there is genuinely a self-esteem deficit. This self-esteem work is unfortunately shown to be detrimental in girls with narcissistic personality traits,[40] which speaks to the value of viewing a patient holistically. Since research finds that opposingly comorbid ADHD/CD results more in this higher rate of recidivism than simply ADHD, it is logical to consider other criminogenic factors when managing the care of this population.

This means that truly managing the recidivism risk of those with ADHD may involve working pre-emptively to resolve social and educational problems associated with criminality, as well as treating their ADHD. The use of medication has been shown to reduce rates of impulsive behaviours,[14] a sizeable criminogenic factor in ADHD, and so by combining a biopsychosocial approach to care from a young age, the risk of people with ADHD forming a criminal career could decrease.

A contentious diagnosis: 'Adult ADHD', controversies, and overdiagnosis.

ADHD as a diagnosis has a long history of controversy. Arguments as to whether it is underdiagnosed or over-diagnosed are rallied back and forth, and the use of controlled drugs in children is known to raise eyebrows. In the US, up to 9.4% of children are estimated based on parent reports to have received a diagnosis of ADHD[51] compared to a global estimate of 5.9% prevalence rate in youth,[14] a discrepancy suggesting children could potentially be getting misdiagnosed. The literature on ADHD primarily focuses on young boys of Caucasian and east Asian backgrounds,[14] so it can be challenging to spot the presentations of the condition in other groups such as girls, older adults, and other BAME populations.

In recent years there has been a lot of discussion surrounding the concept of ADHD in adulthood, or 'adult ADHD'. Of course, ADHD is a developmental disorder and has the requirement of beginning in

childhood.[3] Still, there is a theory that ADHD symptoms can go unnoticed until the structure of childhood and education is removed, and patients enter the adult world. It is currently estimated that up to 70% of ADHD cases resolve to below diagnostic thresholds by adulthood as the PFC matures,[52] meaning almost a third of cases continue significantly through adulthood.

Interestingly, a four-decade longitudinal study of over 1000 New Zealanders found that many adults presenting with the symptomatic profile of ADHD seemingly did not have the polygenic risk factors or childhood symptoms that would portray their symptoms as a childhood-onset neurodevelopmental disorder.[53] Therefore, it has been suggested that the aetiology of this picture of symptomatology (and arguably of ADHD itself) is more complex than initially conceived, with more research needed to be done on the issue.[53] Research has shown various factors, including deprivation and traumatic brain injury, to result in an ADHD-like symptom profile[14] and although not necessarily the same condition, the needs of people with ADHD should also be arguably applied to adults for whom this is the case.

Of course, we have previously established that ADHD is not generally a sole cause of offending behaviour[41] and so should not be used as an excuse by any means. However, understanding the struggles adults with ADHD face could help foster empathy in supporting those who offend in getting the support they need. It is recognised that hyperactivity often presents itself internally in adults with ADHD, often as restlessness[3] (which is admittedly an easy symptom to malinger for the case of an hour-long consultation) but by looking longitudinally for earlier signs of ADHD, a more solid diagnosis could be offered to provide the support needed.

But why would patients look to feign ADHD if it bears little impact on sentencing? As with ADHD in children, the first-line management of ADHD in adults is with psychostimulant medication (drugs that have high street value). A study of the Swedish national pharmacy found that 7.6% of patients prescribed methylphenidate overused it, and this risk was doubled for those with a history of substance misuse.[51] Therefore, it is understandable why practitioners may be hesitant to prescribe and, by extension, diagnose ADHD in high-risk groups for criminal behaviour, especially considering the high-turnover rate of prison settings offers little time for extensive psychiatric interviewing.

There is also scepticism that arises towards the contribution of pharmaceutical companies' involvement in research, with even the initial report being co-created by one: Takeda.[1] While it is true that this involvement may offer bias towards the use of medication in management, extensive literature demonstrates the efficacy of medical intervention over non-pharmacological techniques in reducing ADHD symptoms.[14] Despite this, there are both non-stimulant and non-pharmacological approaches to managing ADHD across all ages, so diagnosis should not be withheld due to the risk of substance abuse.

ADHD is recognised internationally by research as being a valid and treatable diagnosis that can persist into adulthood,[14] and there is a growing body of evidence supporting the use of psychometric testing[54] as support when the differential is under doubt (as is established could be the case in forensic settings). Management aside, it can be argued that recognising ADHD could at least improve a holistic understanding of the reasons behind a patient's risk and allude to potential methods of addressing the related risk factors for offending behaviours discussed earlier in this essay.

Thinking of the children: An insight into management and trauma-informed

Throughout this essay, it has been discussed how ADHD collaborates with various facets of identity and living to increase the longitudinal risk of offending behaviour. Thankfully, ADHD is one of the

most manageable conditions in which psychiatrists specialise due to the high efficacy of its pharmacological treatments.[6]

However, in an ideal situation, we would look at a patient with ADHD with more of a psychosocial perspective. As previously established, adults who commit crimes have a higher likelihood of having experienced trauma as a child,[30] so it is essential to implement trauma awareness into these patients' care. Trauma-informed care is defined as organising a patient's treatment around being aware of adversities they may have faced to not re-traumatise them, damaging the therapeutic relationship.[29] This individualised approach may be a staunch contrast to the quick screening suggested in the article.[2] However, one study found that the screening tools used by probation officers increase the rate of detection, which currently has been shown to lie at only 7.6%.[55]

So, it stands to question- why are detection rates so low? Well, there are a lot of potential reasons that could be suggested. One could suggest the unstable home environment that offenders face during their childhood leads to the disorder being missed in the shadow of more obvious sociological issues. Another theory that has had little research yet is the concept of 'Afterschool Restraint Collapse', coined by psychotherapist Andrea Loewen Nair.[56] Restraint collapse describes the occurrence of explosive negative behaviours upon returning to a familiar environment due to masking in situations where higher levels of concentration are required.[56] If this theory holds, this could lead to frustration from parents as they would often feel their concerns about their children go unnoticed by teachers and that their child's behavioural issues derive from poor parenting techniques rather than from neurodevelopmental disorder. Research must be done into this proposed phenomenon as a reason for the under-detection of ADHD in children.

Nevertheless, screening has been demonstrated to be efficacious at detecting ADHD in previously missed cases. However, without a knowledgeable clinician, there remains a risk not only of the substance misuse previously discussed but also of missing the broader problems contributing to an offender's behaviour. In such cases, it was previously mentioned that psychometric testing may be of use (for example, QbTech tests) due to its high sensitivity in picking up those with ADHD.[54] While not diagnostic, it could undoubtedly supplement the screening tools used by probation officers and other professionals who are not trained clinicians.

There are two valid sides to the argument of which form of pharmacological treatment is suitable for those with suspected ADHD. In the case of an incarcerated patient who may soon be released back into society, a top priority is managing risk to others as quickly as possible through the control of any criminogenic factors. Due to this, psychostimulants such as methylphenidate may be the most suitable approach. However, other options could be considered due to the risks associated with controlled substances in populations with forensic histories. One example is atomoxetine, a second-line treatment in both children and adults with ADHD that is suitable for use in those with SUD.[14,57] This is because of the risk of abuse due to having a lower street value than psychostimulants. Another option are α2-adrenoreceptor agonists such as guanfacine, but atomoxetine is preferred due to its moderately lower cardiovascular risk profile in comparison to these medications and psychostimulants, making it safer for combination with other illicit drugs such as cocaine.[57]

Of course, medication is not the only option in managing ADHD- in fact, in children, the first line of treatment is behavioural modification. Applying this, it is reasonable to suggest that assisting parents with techniques to manage their child's ADHD could help minimise both symptoms and, consequently, offending behaviours. One way in which this could be done is by educating parents on how to apply knowledge about ADHD brains into their parenting style- one meta-analysis of 21 studies showed that children with ADHD tend to prefer immediate reward for their good behaviours

as opposed to delayed reward,[12] and so strategies like this could be implemented over the harsh parenting styles shown to heed worse outcomes. People with ADHD are also known to thrive under structure,[58] something that can be applied positively not only to parenting but to the prison system, while also working on other criminogenic factors such as low self-esteem through tools such as positive reinforcement.

In conclusion: a plea for kindness

ADHD is not a reason to absolve people who commit crimes of accountability for their actions. It is a diagnosis characterised by inattention, impulsivity, and hyperactivity- not offending behaviours- and research suggests that antisocial traits are more associated with cooccurring conduct disorder and personality disorder, not with ADHD alone.[41]

Nevertheless, it is easy to understand that ADHD could be a strong driving influence that leads individuals into a criminal career when compounded with various sociological factors. The diagnostic core traits combine with emotional dysregulation to cause impulsive outbursts, and their susceptibility to these behaviours leads to creating even worse social situations for their children, that (due to high inheritability) will most likely have the disorder too, thus continuing the cycle.

The Takeda report discussed in the guardian emphasised the harsh disparity between the disproportionately high prevalence of ADHD in those incarcerated and its' rate of detection and treatment from professionals.[1] This is where the role of the psychiatrist is most useful; one could propound that it is essential for psychiatrists (as per the views of the WHO) to acknowledge the debilitating impact of ADHD, including its progression into adulthood and its role as a criminogenic factor.

But recognition and pharmacological management alone does not suffice. There is rightfully a recent shift towards a more holistic approach to managing psychiatric illness, including practising trauma-informed care. It is time, as their doctors, to start minimising our prejudice and reflect on those who commit crimes as human beings who have often been the victim of compounding adverse circumstances. More research must be done into getting a more holistic perspective of how ADHD influences behaviour, including study of symptoms outside of the criteria and anecdotally witnessed phenomena such as 'rejection sensitivity dysphoria' and 'afterschool restraint collapse'.

With the report from Takeda showing a sizeable prevalence of ADHD in the forensic population,[1] perhaps switching focus to the swift diagnosis and management of this condition could be the starting catalyst to helping forensic patients better themselves and protect the public from recidivistic behaviours in the future. After all, it is essential to view every patient as capable of change, as if their healthcare provider does not have faith in the possibility of rehabilitation, how can the individual believe in it themselves?

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