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■ It is well established that ADHD prevalence rates are higher among youth and adult prison inmates than in the general population

ADHD in the criminal justice system: challenges and recent findings

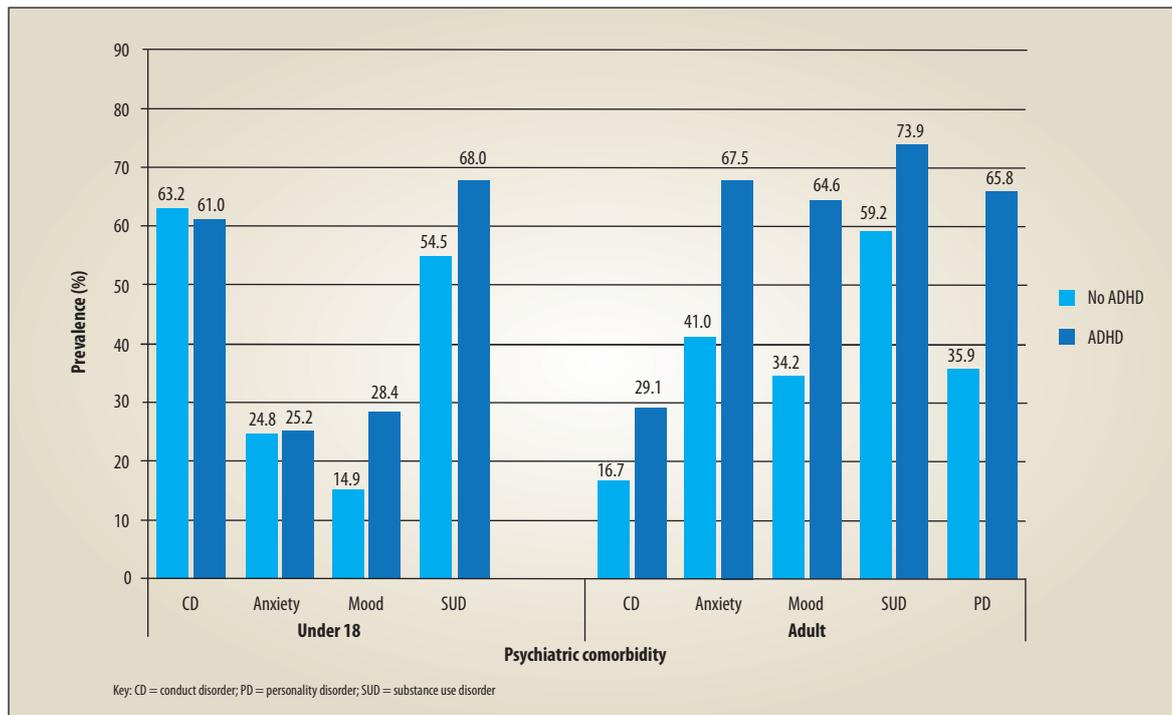
Attention deficit hyperactivity disorder (ADHD) is characterised by a combination of symptoms including inattention, hyperactivity/impulsivity, as well as overall problems with executive functioning and the ability to self-regulate. Hyperactivity and impulsivity symptoms are often related to externalising and are associated with behavioural problems later in life.¹ The expression of these core ADHD symptoms may have a strong link with delinquency and criminality. Inattentiveness may also play a role in a delinquent trajectory, taking place through low educational attainment and functional deficits in daily living. In this context, it is not surprising that adolescents and adults with ADHD abound in correctional services worldwide, and come into contact with the criminal justice systems more often than individuals without the disorder. Here, we review the latest findings regarding the links between ADHD and offending behaviours, and the most recent international prevalence rates of the disorder in prisons. In addition, the implications of having ADHD and its main comorbidities in the criminal justice system, and the role of treatment in this setting are discussed.

Over-representation of ADHD in prisons

In recent years, a growing number of studies have reported on the prevalence of ADHD among

youth and adult inmates, albeit with a wide variation in their estimates. Methodological differences across studies conducted in Asia, North America, Sweden, Brazil and the UK, among others, may have contributed to these disparities. However, studies have consistently found higher prevalence rates of ADHD among youth and adult prison inmates than in the overall population.²⁻⁴ ADHD diagnostic guidelines require the presence of significant symptoms during childhood, before the age of 12 years.⁵ Performing a clinical diagnosis in prison, where inmates are unlikely to have been previously diagnosed, requires that these symptoms be retrospectively established; this is a challenging process and can lead to a margin of error within reported prevalence rates.

To avoid the inaccuracies resulting from such screening processes, Young and colleagues performed a meta-analysis of 42 international studies based on data derived from symptom-based clinical instruments.⁶ Among the youths and adults in their prison samples, they found that 30% and 26%, respectively, had clinically diagnosable ADHD. The researchers did not find differences for gender and age; these estimates are not mirrored in the general population, where the prevalence of the disorder is greater among males. This finding implies that the protective factors that typically prevent females from entering the criminal justice system and receiving custodial sentences are absent among women with ADHD.



■ **Figure 1**
Proportion of psychiatric morbidity categories in inmates with and without ADHD across prison samples

Similarly, a disproportionate number of cases of ADHD have been reported in samples of those in police custody and in the care of probation services.⁷ By any measure, these rates are strikingly and consistently elevated, and represent a five- to tenfold increase above community population rates. These results, when assessed alongside findings from follow-up studies that have reported statistically significant incarceration rates among those diagnosed with hyperactivity and ADHD as children,^{8,9} are evidence of a prospective association between ADHD and incarceration, confirming that individuals with ADHD interact with the prison system more often than individuals without the disorder. Evidence also suggests that, despite its complex presentation and even greater severity of symptoms, ADHD remains an underdiagnosed mental health disorder in the offender population.⁷

ADHD in the forensic setting

ADHD has been associated with behavioural disturbance incidents in police custody, prison and forensic mental health settings, which has evident resource implications. Information gathered from police custody records has demonstrated that ADHD contributes significantly to increased requests being made of staff.¹⁰ Critical incidents (that is, incidents of behavioural disturbance) involving verbal and physical aggression and damage to property have been linked to ADHD via official prison records.¹¹ This association, which is likely to be specific to the hyperactive/impulsive

domain of symptoms,¹² may impede progress within the institution, result in extension of current convictions and prevent early release. In addition, emotional dysregulation may play a primary role in these behaviours, together with poor frustration tolerance and persistent feelings of distress. Executive function deficits, such as impairments in time management and organisational skills, may also contribute to a more difficult prison experience as they limit the ability to meaningfully engage in rehabilitation, education and social activities.

Evidence shows that youths with ADHD who come into contact with the criminal justice system may be more prone to repeat offending. Studies evaluating the association between ADHD, re-offending and repeated incarceration have reported a younger age of engagement with the criminal justice system and significantly higher rates of recidivism compared with controls.^{8,13} In a prospective study that employed survival analysis, Grieger *et al* found that the time to re-offending was shorter for inmates with ADHD.¹⁴ In a recent study, positive ADHD screening was associated with earlier age of arrest, which, in turn, led to an increased likelihood of re-offending.³ Further research, ideally prospective studies, will be helpful to clarify this relationship.

The strong links found between ADHD and substance use disorders (SUDs) complicate the associations with recidivism. Offenders with coexisting SUD may be more likely to re-offend, simply because of the criminalised status of most substances. These indi-

Youths with ADHD [...] may be more prone to repeat offending

viduals may also be engaging in property theft in order to finance their substance misuse habit. The literature confirms that such a scenario could be at play, with a recent study reporting that drug-dependent offenders with ADHD were more likely to engage in acquisitive offending.¹⁵ Likewise, Barkley and colleagues reported in their 13-year follow-up study that those with early hyperactivity were at increased risk of committing property offences and drug-related antisocial conduct.¹⁶ In addition, individuals classified as having combined hyperactivity and conduct disorder reported greater substance use than those with hyperactivity alone or those with neither.

Comorbidity

It is well documented that ADHD in adults is a highly comorbid mental health disorder.¹⁷ Offenders with ADHD are more likely to have higher rates of coexisting psychopathology and greater impairment due to mood, anxiety and personality disorders.¹⁸ These comorbid conditions will likely impact the ability of offenders to cope effectively with the inherent stress and burden of imprisonment. Inmates with ADHD and comor-

bid conditions present additional challenges to prison health services. A study conducted with Swedish inmates in a maximum-security facility found that the severity of ADHD in the confined population was greater than that encountered in a group of psychiatric patients with ADHD selected from community treatment programmes. Although 80% of inmates fulfilling clinical criteria for ADHD had a history of school problems, only 7% had been formally diagnosed during childhood.² These findings indicate that difficulties in diagnosis and/or service disparities contribute to the adversity of incarceration. Improved awareness of the condition and its comorbidities, and a better understanding of beneficial interventions are required to allow for inmate rehabilitation.

Researchers within our group recently combined findings from all available published studies on comorbid conditions associated with ADHD in prison samples.¹⁸ This meta-analysis included rates of coexisting conduct disorder, mood disorders, anxiety disorders, SUD and personality disorders. A total of eighteen studies with data from 1,615 people with ADHD and 3,128 without ADHD were included. Results demonstrated that the risk of psychopathology is increased among adult prisoners with ADHD compared with prisoners without the disorder (see Figure 1). Interestingly, associations with all psychiatric disorders were present in adult offenders with ADHD, but in youth offenders only an association with mood disorders was observed. The observed differences between youths and adults suggest an incremental effect for the development of further psychiatric morbidity over time.

Treatment

International guidelines state that treatment in correctional services should match the standards of interventions that are available for individuals in the community.¹⁹ Many patients with ADHD left untreated will be more vulnerable to adverse outcomes later in life, including problems related to social, occupational/academic and emotional functioning.²⁰ Long-term outcomes for antisocial behaviour in ADHD have been disappointing, with only 50% benefitting from treatment.²⁰ This highlights the challenges in managing offenders with ADHD, where motivation and engagement are poor and the availability of suitable evidence-based interventions is lacking. An important recent study highlights the need for identification and treatment of ADHD in offenders. Using national population registers in Sweden, 25,656 individuals with a diagnosis of ADHD with criminal convictions over a four-year period showed a re-

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Key points

- Studies have found comparatively high prevalence rates of ADHD among youth and adult offenders; however, evidence suggests that ADHD remains an underdiagnosed disorder in the offender population.
- ADHD has been associated with behavioural disturbance incidents in the criminal justice setting, which may impede progress within the institution and result in extension of current convictions, while executive function deficits may limit the ability to meaningfully engage in rehabilitation, education and social activities.
- Youths with ADHD who come into contact with the criminal justice system may be more prone to repeat offending. Studies have also reported a younger age of engagement with the criminal justice system for those with ADHD.
- Offenders with ADHD are more likely to have higher rates of coexisting psychopathology and greater impairment due to mood, anxiety and personality disorders. These comorbid conditions will likely impact their ability to cope effectively with imprisonment.
- Inmates with ADHD could benefit from comprehensive treatment programmes that include both pharmacological and psychosocial interventions.

duction in crime rate of 32% and 41% respectively for men and women when on medication compared to periods of non-medication.

Information regarding the treatment of offenders with ADHD is very limited. International treatment guidelines, such as those issued by the National Institute for Health and Care Excellence in the UK,²² are consistent in recommending pharmacological stimulant medication. An important issue in this context is the reluctance of clinicians to prescribe stimulant medication or the non-stimulant atomoxetine to offenders with ADHD. Treatment with methylphenidate and amphetamines in patients with co-occurring SUD has shown that stimulants can be used safely in such populations, and are associated with a relatively low risk of abuse under closely monitored conditions.²³ The benefits, in terms of improved quality of life and diminution of symptoms, may outweigh the possible risks associated with pharmacological treatment in prison, as recently demonstrated in a sample of incarcerated adults with ADHD and SUD.²⁴

Nevertheless, pharmacological treatments do not address the need to develop strategies (that is, skills such as self-control and planning) for the effective management of the functional impairment associated with ADHD symptoms. Non-pharmacological treatments, such as cognitive behavioural therapy (CBT), meta-cognitive therapy, coaching and psychoeducation are available for adults with ADHD, and are often used in the community and in clinical trials. Recent reviews suggest that CBT is an effective treatment component in combination with medication, contributing to significant improvements in ADHD symptoms and associated co-morbidities.²⁵ Inmates with ADHD could, therefore, benefit from a comprehensive programme that includes psychosocial interventions. Alternative treatments including nutritional supplements have also shown some promise. Findings from a recent RCT in which a nutritional supplement comprising vitamins and minerals (and no omega-3 fatty acids), helped reduce self- and observer-ratings of ADHD symptoms.²⁶ Interestingly, there was also a significant reduction in coexisting symptoms of depression in the experimental group. These preliminary findings show potential in the treatment of ADHD in adults, in which first-line treatments are not effective.

Conclusions

Many individuals with ADHD and associated neurodevelopmental disorders do not come into contact with correctional services. Investigation should be aimed at elucidating moderating factors that affect the ADHD symptom course towards a delinquency trajectory. The prison population is

characterised by severe adversity throughout development, including poverty, deprivation and early abuse. In developmental terms, the onset of ADHD symptoms will most likely occur earlier than that of comorbid disorders and offending behaviours; therefore, primary prevention strategies targeting children at risk may help improve long-term outcomes. Early interventions targeting youths with early manifestations of hyperactivity constitute a priority for research.

Declaration of interest

The author declares that there is no conflict of interest.

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