



Neurocognitive deficits and psychiatric disorders in a NSW prison population

Leila Kavanagh^{a,*}, Donald Rowe^b, Jolyn Hersch^c, Kylie J. Barnett^b, Robert Reznik^a

^a Justice Health, Sydney, NSW 2036, Australia

^b Brain Resource, Sydney, NSW 2007, Australia

^c School of Psychology, University of Sydney, NSW 2006, Australia

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ABSTRACT

Approximately 75% of inmates in New South Wales (NSW) have mental health issues (Butler & Alnutt, 2003). Scarce resources force the management of acute psychiatric symptoms only, meaning that co-morbid conditions such as neurocognitive deficits are less likely to be assessed. The objective of this study was to investigate the utility of a computerized battery in the assessment of inmates within the criminal justice system. Thirty male inmates were assessed. Data were compared to matched controls. The custodial sample was characterized by an increase in the prevalence of previous trauma; high levels of depression, anxiety and stress and neurocognitive deficits, including sustained attention, impulsivity and executive dysfunction.

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1. Introduction

Prisoners generally come from a socio-economically disadvantaged background. Sub-optimal education, high unemployment rates, frequent interfamilial discord, parental substance abuse and domestic violence, place individuals at high risk for early childhood trauma and neglect (Butler & Alnutt, 2003; Cima, Smeets, & Jelicic, 2008; Lang, af Klinteberg, & Alm, 2002). These factors can lead to the development of psychological disturbances in early childhood with subsequent delinquent behaviour and criminal offending (Murphy & Barkley, 1996). Inmates enter the prison service in a distressed state, with poor physical and mental health and high rates of substance use disorder (Butler & Alnutt, 2003; Chiles, Von Cleve, Jemelka, & Trupin, 1990). They are often transient and may be transferred to other correctional facilities without adequate mental health services or released on bail without appropriate follow-up (Birmingham, 1999).

There is a high prevalence of Axis I and Axis II disorders within prison populations (Stålenheim & von Knorring, 1996). The incidence of mental health problems within the New South Wales (NSW) criminal justice system has been previously documented. A 1996 cross-sectional survey conducted by the NSW Corrections Health Service (CHS) found that 50% of female and 33% of male prisoners reported having been diagnosed with a mental illness (Butler, 1997). This was a self-report study; however it highlighted the demand for mental health services within NSW prison settings.

Another large survey of the prevalence of psychiatric disorders among the NSW prison population was conducted by the CHS in 2003 (Butler & Alnutt, 2003). Of the 1532 inmates (953 receptions and 579 sentenced), 74% had at least one psychiatric disorder in the 12 month period prior to interview. Substance use disorder was found to be the most common diagnostic group with 66% of reception inmates and 38% of sentenced inmates meeting diagnostic criteria in the previous year. The prevalence of psychiatric disorders was significantly higher than that found in the Australian community. The disorders were derived using a modified version of the CIDI (Composite International Diagnostic Interview, which yields both DSM-IV and ICD 10 diagnoses). The comparative twelve month prevalence rates for disorders are shown in Table 1.

The lack of sufficient resources, coupled with time constraints and the overwhelming demand for psychiatric services decreases the likelihood that inmates will undergo thorough clinical assessments. Most commonly, only acute psychiatric symptoms are treated and individuals are returned to the general prison population. The 2003 findings emphasized the enormity of the demand for mental health services within NSW prison settings.

There have been relatively few attempts to assess cognition in the NSW forensic population. Underlying conditions, such as neurocognitive impairments, which may play a major role in wellbeing and successful reintegration, are likely to be overlooked. For example, from a random sample of 200 inmates from the NSW criminal justice system, 82% reported past traumatic brain injury (TBI) (Schofield, Butler, Hollis, Smith, Lee, & Kelso, 2006). Similar percentages have been reported in the United States (87% of a county jail population had a previous history of TBI) (Slaughter et al., 2003). TBI and other neurocognitive deficits are likely to have significant behavioural sequelae in forensic settings.

Neuropsychologists working for the Department of Corrections Services (DCS) may be called upon to perform assessments. Referrals

* Corresponding author. Consultant Forensic Psychiatrist, Justice Health. P.O. Box 150, Matraville, NSW 2036, Australia. Tel.: +61 2 9700 3000.

E-mail address: leila.kavanagh@justicehealth.nsw.gov.au (L. Kavanagh).

Table 1

Twelve month prevalence rates for psychiatric disorders for comparative community rates and rates within the NSW prison population.

Psychiatric disorder	Comparative community rates	NSW prison population rates
Any psychiatric disorder	22%	77%
Psychosis	0.42%	9%
Affective disorder	6%	22%
Anxiety disorder	10%	43%
Substance use disorder	5%	57%
Personality disorder	7%	43%

are received from different sources including doctors, nurses, the Probation and Parole Board, the Mental Health Review Tribunal and the Courts. Assessments include tests of IQ, memory, attention, concentration, and executive functioning. The results may be used to determine 'fitness to plead' and/or requirements for specific services to facilitate rehabilitation. Diminished responsibility for a crime may be considered if an inmate has a low IQ or severe memory deficits. While there is evidence to suggest that prison inmates may have an increase in the prevalence of neurocognitive deficits associated with adult Attention Deficit Hyperactivity Disorder (ADHD) (Eyestone & Howell, 1994; Gudjonsson, Sigurdsson, Einarsson, Bragason, & Newton, 2008; Rasmussen, Almvik, & Levander, 2001; Vitelli, 1995), the disorder is not routinely assessed in this population.

Research within prison samples has previously reported a high incidence of adult ADHD and impulse-related disorders (Johansson, Kerr, & Andershed, 2005; Rösler et al., 2004; Vitacco & Rogers, 2001). A meta-analysis of 33 studies of adults with ADHD found neurocognitive impairments in sustained attention, behavioural inhibition and memory (Hervey, Epstein, & Curry, 2004). Adults with ADHD are more likely to be among those detained in prison (Rasmussen et al., 2001).

Previous reports suggest that approximately 50% of inmates had ADHD in childhood, and of these about half meet full or partial criteria as adults (Eyestone & Howell, 1994; Gudjonsson, Sigurdsson, Einarsson, Bragason, & Newton, 2008; Rasmussen, Almvik, & Levander, 2001; Vitelli, 1995). Rösler et al. (2004) assessed the prevalence of ADHD and other co-morbid conditions in male prisoners aged 17 to 21 years. The prevalence of ADHD in prisoners was 45% and the prevalence of 'disturbed activity and attention' and hyperkinetic conduct disorder was 21.7%. Young et al. (2009) assessed the prevalence of ADHD symptoms in 198 Scottish male inmates. 24% of prisoners met criteria for childhood ADHD, of whom 23% were fully symptomatic. Adult ADHD is associated with a high prevalence of co-morbid disorders. In a large cohort of 372 individuals with adult ADHD, the lifetime co-morbidity with mood disorders was 57.3%, with anxiety disorders 27.2%, and with substance use disorders 45.0% (Jacob et al., 2007).

The aim of this study was to aid clinicians in the psychiatric assessment of inmates using a computerized tool, in conjunction with clinical assessment. Thirty male inmates were assessed using a self-administered computerized battery (IntegNeuro), which takes approximately 45 min to complete. This standardized battery was administered using a personal computer attached to an IBM touchscreen. The battery contains reliable, well validated psychological and neuropsychological tasks (Clark et al., 2006; Paul et al., 2005), which have been used worldwide in both clinical and healthy control populations (Paul et al., 2007). The battery was modified to address the specific needs of the inmate population (i.e., a shorter battery of 11 tasks was used). The benefits of standardized assessment include automated data collection, time efficiencies, and the release of the clinician from task administration to focus on treatment (American Psychological Association, 1987). This evidence-based approach, in conjunction with clinical assessment was expected to aid in the diagnosis and management of individuals within a custodial setting.

2. Method

2.1. Participants

This study was approved by the Justice Health research unit as a quality assurance project. Inmates referred to Justice Health Mental Health services for assessment at the Metropolitan Reception and Remand Centre (MRRC) at Silverwater Correctional Centre, Sydney, NSW, were asked to participate in the study. All participants gave signed informed consent. Participants included 30 male inmates and 58 matched controls. The inmate sample came from the general prison population and included individuals who had mental health problems and were able to undergo assessment. Exclusion criteria included limited English, being in custody for less than six weeks (i.e., inmates who were in an acute distressed or crisis state), acute psychotic symptoms at the time of testing, substance withdrawal states, or other severe symptoms (e.g., depression or anxiety) that would interfere with the ability to undergo assessment.

Those selected, underwent a routine mental health assessment and IntegNeuro. On the testing day, inmates who were on the list of those who had consented to participate in the study were opportunistically (randomly depending on availability) selected to undergo IntegNeuro. All had already undergone a routine mental health assessment. A DSC officer on duty that day in the Mental Health Screening Unit (MHSU) was asked to randomly choose an inmate from the list. In those cases where an inmate had already been released from custody or had been transferred to another facility or was otherwise unavailable, another name was chosen at random from the list by the officer. The choice of participants on different days was made by different officers who had no prior knowledge of the inmates. To evaluate the utility of the assessment, after completion inmates and supervising officers were asked to complete a simple evaluation form. The officer supervising the assessment provided feedback regarding the level of supervision the inmate required.

The control group ($n=58$ males) was obtained from the Brain Resource International Database (BRID) (see Gordon, 2003). The normative database contained data from over 1000 participants. Data were acquired from sites in Australia, the USA, UK, and South Africa, with each laboratory having identical set-ups and procedures to ensure comparability of data. Exclusion criteria for controls included head injury, history of psychiatric illness [screened using the SPHERE; (Hickie, Davenport, Naismith, & Scott, 2001)], neurological disorders or other serious medical conditions including a history of drug or alcohol addiction assessed using the AUDIT (WHO Alcohol Use Disorders Identification Test; Barbor, Higgins-Biddle, Saunders, & Moneiro, 2001). Controls were matched according to age and years of education.

2.2. Demographics

The mean age of inmates was 31.9 years ($SD=11.0$). The mean age of controls was 31.7 years ($SD=10.1$). The groups did not differ for age [$t(85)=0.060$, $p=0.953$]. The majority of inmates left school in grade nine. There was only one university graduate in the inmate sample. All, with the exception of this individual had committed impulsive drug-related crimes. The custody sample had a mean of 9.6 ($SD=2.6$) years of education and the control group a mean of 11.2 years ($SD=2.2$). Despite attempts to match the groups, controls had a significantly higher number of years of education [$t(85)=-3.109$, $p=0.003$]. For this reason, years of education was entered as a covariate in the analyses. A large number of inmates (43%) had long criminal histories for drug-related offences. This was the first time in custody for 31% of inmates (these inmates had committed serious indictable offences), the second time for 17%, the third time for 10% and the fourth time for 41%.

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