Subtypes of severely mentally ill violent offenders in a Spanish Forensic Psychiatric Hospital

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Abstract

Conduct disorder (CD) prior to age 15 identifies a subgroup of men with severe mental illness (SMI) who present a high risk for violence that persists across the life-span. The present study examined male violent offenders with SMI in a forensic hospital in Spain, comparing those with SMI+CD and those without SMI-CD on the HCR-20 and PCL:SV. Violent offenders with SMI+CD obtained higher HCR-20 and PCL: SV total scores, and much higher H and factor 2 scores as compared to those without prior CD. Men with SMI+CD present a challenge to forensic psychiatric services.

Keywords: Schizophrenia, Violence, Conduct Disorder, HCR-20, PCL:SV

INTRODUCTION

There is robust evidence that among violent offenders with severe mental illness (SMI), the age of onset of antisocial and aggressive behaviour defines sub-types with distinctive features and risk of recidivism (Hodgins, 2008). Those who commit most offences present Conduct Disorder (CD) prior to age 15. Others with no childhood history of conduct problems begin engaging in aggressive behaviour as illness onsets. A small group with no prior history of aggressive behaviour engages in serious violence, usually against a care-giver, after many years of illness.

Among men with schizophrenia, those with a history of CD prior to age 15, are convicted for more non-violent and violent crimes (Crocker et al., 2005; Fulwiler & Ruthazer, 1999; Mueser, Crocker, Frisman, Drake, Covell, & Essock, 2006), commit a more diverse array of crimes (Hodgins, 2004), and have criminal histories similar to those of non-mentally ill offenders who also have a childhood history of conduct problems (Hodgins & Côté, 1993; Schug, Raine, & Wilcox, 2007). In addition, almost all display a pattern of substance misuse going back to early adolescence (Fulwiler, Grossma, Forbes, & Ruthazer, 1997).

In a prospective investigation that followed a Dunedin, New Zealand birth cohort to age 26, 40% of the cohort members who developed schizophreniform disorders had displayed CD prior to age 15 (Kim-Cohen, Caspi, Moffitt, Harrington, Milne, & Poulton, 2003). In clinical samples of adults with schizophrenia, the prevalence of CD is lower, approximately 20%, among both women and men (Hodgins, Côté, & Toupin, 1998), but for example in a UK sample of inpatients, CD prior to age 15 characterised 42.0% of the men and 22.4% of the women with SMI (Hodgins, Cree, Alderton, & Mak, 2008). While these samples of patients with SMI or schizophrenia

were recruited in general psychiatric services, among patients in forensic services the prevalence of CD is higher, and among those incarcerated in correctional facilities it is further elevated (Hodgins et al., 1998).

A sample of 248 men with schizophrenia who were, on average, aged 39.8 years old at the time of the study were assessed in the two weeks before discharge from hospital using multiple sources of information including complete criminal records (Hodgins, Tiihonen, & Ross, 2005). Fifty-two (21%) of these men met criteria for CD prior to age 15. Incident Rate Ratios (IRR) were calculated to estimate the association between CD and the number of convictions for violent crimes. A diagnosis of CD prior to age 15 was associated with an increase of 2.29 (95 % confidence interval (CI) 1.31-4.03) in the number of convictions for violent crimes after controlling for life-time diagnoses of alcohol and/or drug abuse and/or dependence. Each CD symptom present before the age of 15 was associated with a 1.15 (95% CI 1.06-1.25) increase in the number of convictions for violent crimes, again after controlling for diagnoses of substance misuse disorders. A diagnosis of CD and the number of CD symptoms were also associated with the number of convictions for non-violent crimes. These results were replicated in a sample of UK inpatients with SMI (Hodgins, Alderton, Cree, Aboud, & Mak, 2007). After controlling for sex, age, current alcohol and drug use, CD prior to age 15 was associated with a two-fold increase in the number of convictions for violent crimes. Again, after controlling for sex, age, and substance misuse, each CD symptom present before age 15 was associated with a slight increase in the number of violent crimes odds ratio (OR) 1.16, (95% CI 1.01-1.35). Both CD diagnosis and the number of CD symptoms were associated with the number of convictions for non-violent crimes. Importantly, no sex differences in the associations of CD and later offending were detected. These results concur with findings from other studies that used

different definitions of childhood conduct problems (Fulwiler, & Ruthazer, 1999; Rice & Harris, 1995; Tengström, Hodgins, Grann, Långström, & Kullgren, 2004).

Both in the general population (Moffitt & Caspi, 2001) and among people with schizophrenia, CD is a precursor of aggressive behaviour, as well as violent criminality. In the sample of 248 men with schizophrenia described above, the diagnosis of CD and the number of CD symptoms were associated with an increased the risk of aggressive behavior, after taking account of life-time diagnoses of alcohol abuse and/or dependence, alcohol and drug use during the follow-up period, depot medication or medication compliance, and obligatory care. The diagnosis of CD did not predict aggressive behavior, however, after controlling for life-time diagnoses of drug abuse and/or dependence diagnosis. Each CD symptom increased the risk of aggressive behavior by a factor of 1.2, and this remained significant after controlling for life-time diagnoses of alcohol and drug use disorders, self-reported alcohol and drug use, drugs detected in urine or hair or a refusal to provide a sample, depot medication or self-reported compliance, and a court order to comply with treatment (Hodgins et al., 2005). In the UK sample of men and women with SMI described above, after controlling for age, sex, and current substance misuse, CD diagnosis prior to age 15 was associated with an increased odds of aggressive behaviour towards others in the previous six months (odds ratio 2.66, 95 % CI 1.24-5.68), as was each CD symptom (odds ratio 1.29, 95 % CI 1.11-1.50) (Hodgins et al., 2008). Similar findings emerged from analyses of baseline data collected for a large trial of medications in the US. While this study used the same instrument to assess aggressive behaviour as did the previously described studies, unlike the previous studies described above, symptoms were not measured prospectively but at the same time as the aggressive behaviour. Two or more CD symptoms were found to be associated with aggressive behaviour in the previous six

months after controlling for numerous other factors, and, as in the previous studies, there was no association with substance misuse after taking account of childhood conduct problems (Swanson et al., 2006).

There is little prospective research on individuals who present conduct problems in childhood and who subsequently develop schizophrenia (SZ+CD). An important finding has emerged from the prospective longitudinal investigation of a birth cohort in Dunedin, New Zealand. As previously noted, and consistent with other epidemiological evidence, the risk of violence was elevated among cohort members who developed schizophreniform disorder by age 26. This association was partially explained by the presence of aggressive behaviour at ages 7, 9, and 11 and psychotic-like-experiences at age 11 (Arseneault, Cannon, Murray, Poulton, Caspi, & Moffitt, 2003). In a cohort of twins aged 12 years, those reporting psychotic-like-experiences also reported significantly more antisocial behaviour, depression, and anxiety (Polanczyk et al., 2010). Most other relevant findings on the childhood characteristics of individuals with SZ+CD derive from studies of clinical samples of adults in which data on childhood is collected retrospectively from multiple sources, some objective- school, social service, and juvenile justice records, and some subjective – reports from patients, parents, older siblings. For example, in the sample of 248 men with schizophrenia described above, more of those with, than without CD, obtained lower than average marks in elementary school, failed to graduate from secondary school, and prior to age 18 abused substances, experienced physical abuse, and were institutionalised (Hodgins et al., 2005). The results of other similar studies concur (Fulwiler et al., 1997; Schanda, Földes, Topitz, Fliedl, & Knecht, 1992; Tengström, Hodgins, & Kullgren, 2001). In contrast, while rates of parental criminality are elevated among men with SMI+CD, parents and

siblings of men in this subgroup present similar rates of mental illness when compared to those men with SMI-CD (Hodgins et al., 2005; Tengström et al., 2004).

Recent studies using magnetic resonance imaging (MRI) have shown that men with schizophrenia preceded by CD differ in both brain activity (Joyal et al., 2007) and brain structure (Schiffer et al., 2012) as compared to men with schizophrenia and no history of CD. Further, some of the structural anomalies presented by those with prior CD resemble anomalies of men without schizophrenia who had CD prior to age 15.

The accumulated evidence suggests that the presence of CD prior to age 15 identifies a subgroup of men with SMI who present high levels of violent offending and for violent recidivism. This body of evidence on SMI+CD has remained distinct from the large body of evidence demonstrating the validity of the Historical-Clinical-Risk Management-20 (HCR-20; Webster, Douglas, Eaves, & Hart, 1997) and The Hare Psychopathy Checklist: Screening Version (PCL: SV; Hart, Cox, & Hare, 1995) in predicting risk of violence and identifying factors associated with future violence. This is the first study to compare severely mentally ill violent offenders with SMI+CD and violent offenders with SMI-CD using these clinical tools that are commonly administered in forensic psychiatric services.

We hypothesized that violent offenders with SMI+CD, as compared to those with SMI-CD, would obtain higher HCR-20 total scores, and higher H and R scores. The presence of CD prior to age 15 and high H scores would identify patients with SMI whose antisocial and aggressive behaviours have been present since a young age and that would be particularly resistant to change. Elevated R scores would suggest that the long-standing pattern of antisocial and aggressive behaviour continues to be associated to the higher scores on clinical tools use-to predict risk of violence. Consistent with evidence showing no difference in psychotic symptoms between those with SMI+CD

and SMI-CD, we hypothesized that the two groups of violent offenders would obtain similar C scores (Hodgins, 2008). We also hypothesized that the severely mentally ill violent offenders with SMI+CD would obtain higher PCL:SV scores than those with SMI-CD, and that the elevation in scores would result primarily from higher factor 2 scores consistent with an earlier onset of conduct problems and a more severe pattern of antisocial behaviour. Consistent with studies of SMI+CD, we hypothesized that violent offenders with SMI+CD would have been first convicted at a younger age than those with SMI-CD, that they would have been convicted or found not guilty by reason of insanity for more violent crimes, and that they would engage in more rule breaking within the hospital. To test these hypotheses, we examined a sample of Spanish forensic patients with SMI who had committed violent crimes.

METHOD

Setting

The Alicante Forensic Psychiatric Hospital is a Medium-Secure Psychiatric Hospital which provides treatment for both males and females from all of Spain. The hospital has 375 beds. One ward includes 43 beds for females. The other three treatment wards house male patients and they differ as to level of care and supervision: one for chronic, violent patients without physical deterioration (N= 117); one for chronic, violent patients with physical deterioration (N= 80); and one for violent offenders with primary diagnosis of personality disorder (N= 55). Additionally, there is an admissions ward with 30 beds.

In Spain, individuals who are declared not criminally responsible on the basis of mental disorders undergo a pre-trial psychiatric assessment, and if they are found to have been suffering from mental illness at the time of the offense, they are sentenced to psychiatric treatment at a Forensic Psychiatric Hospital where they are evaluated at least

twice per year in order to review their progress and modify or maintain their legal status.

Participants

The sample included all 117 severely mentally ill violent offenders from the ward hosing violent men without physical deterioration. Patients were included in the study if they: (a) were male; (b) had a primary clinical diagnosis of schizophrenia, schizo-affective disorder, delusional disorder, other psychosis, or bipolar disorder; and (c) had committed at least one violent crime. Of the 117 patients eligible to participate in the study, 12 (10.3%) did not meet diagnoses criteria, 17 (14.5%) refused to take part, and 88 (75.2%) formally consented. Among these 88, 22 (25.0%) had presented a history of conduct disorder prior to age 15 and 66 (75.0%) had not. All 88 patients were assessed in the hospital between September 2012 and February 2013 and information was extracted from clinical files that are up-dated every six months with progress reports from a psychiatrist, psychologist, and social worker as required by the court. The patients were aged, on average, 42.9 years (SD = 9.5). *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV 4th edition; American Psychiatric Association, 1994) criteria for schizophrenia were met by 67.0% (n = 59), while 15.9% (n = 14) presented delusional disorder, 8.0% (n = 7) schizo-affective disorder, 3.4% (n = 3) bipolar disorder, and 5.7% (n = 5) other psychotic disorders. Additionally, 29.5% (n=26) of the sample met criteria for a comorbid diagnosis of personality disorder. Urine tests conducted within the past year when patients returned from outings detected traces of drugs in 9.0% (n= 8) of the participants. The average length of stay at the institution was 151 months (SD = 93.23, range 6-360 months).

Measures

Socio-demographic characteristics were extracted from hospital files and collected from participants and other informants, primarily family members.

Diagnoses of Severe Mental Illness. The DSM-IV (4th ed) classification criteria for Axis I (American Psychiatric Association, 2000) were used to revise all file diagnoses. Clinical information was corroborated through weekly reports from psychiatrists and psychologists who periodically reviewed each diagnosis and carried out an exhaustive evaluation of the patient´s mental state. Given the diverse sources of information and the high degree of consensus among the evaluations, fewer than 5% of the diagnoses were modified by the researchers.

Convictions and judgements of not guilty by reason of insanity. Information was extracted from official criminal records. Violence was defined as in the HCR-20 manual as actual, attempted or threatened physical harm deliberately to others (Webster et al., 1997). Acts of violence included; homicide, murder, assault, injury, robbery offences involving injury to the victim. According to the Spanish Penal Code (arts. 138-140) it is considered murder when the act coincides with at least one of the following circumstances: treachery, cruelty, or the perpetrator has been hired. The categories of homicide or murder were established based on the information collected from the court judgement.

Physical abuse prior to age 15 was documented from patient interviews recorded in clinical files. It was defined as the child having been hit, pushed, kicked, slapped, and any other act resulting in deliberate physical harm. Responses were coded as present (frequently occurred) or absent (occasionally or never).

Hyperactivty. Childhood hyperactivity was defined according to DSM-IV-TR criteria as a persistent pattern of inattention and excessive motor activity present in

more than one setting before age 7. This information was extracted from hospital files. When information was unclear or not available, it was coded as absent.

Family history of mental disorders. Information on mental disorders among family members was extracted from files and coded as present, absent or not available.

Family history of criminality Information on criminal convictions or judgments of insanity among fathers, mothers, brothers and sisters was coded as present, absent or not available and collected from hospital files and from participants during interviews.

Violation on rules in the Institution. Information on violation of rules within the hospital was extracted from hospital files and coded as: (a) non-compliance with timetables; (b) not taking medication during outings; (c) possession of prohibited objects in the institution; and (d) minor acts of aggression (including verbal aggression and property damage not resulting in physical harm).

HCR-20. The HCR-20 (Webster et al., 1997) is a tool that uses structured professional judgment (SPJ) to assess risk of violence and factors associated with risk. It is composed of 20 risk factors grouped into 3 domains: Historical (H), Clinical (C) and Risk Management (R) scored on a 3-point scale (0, 1 or 2) indicating the presence, possible presence or absence of each item. The psychometric properties have been examined in numerous studies reporting rates of moderate to excellent predictive validity (Belfrage, 1998; Douglas & Reeves, 2010). In a recent Spanish prospective longitudinal study exploring the predictive validity of the HCR-20 and PCL:SV (Hart et al., 1995) in a sample of 78 mentally disordered inpatients followed up for 12 months, the ROC analysis yielded moderate to strong association between HCR-20 and violence (AUCs=.69-.77), PCL:SV (AUCs=.61-.70) (for a review see Arbach-Lucioni, Andrés-Pueyo, Pomarol-Clotet, & Gomar-Soñez, 2011) . In the present study a random

sample of 16 patients was rated independently by a second experienced psychologist and the intra-class correlation for the total score was high 0.71.

PCL:SV. The PCL:SV (Hart et al., 1995) consists of 12 items rated on a 3-point scale ranged from 0 to 24. A cut-off of 18 and above has been recommended to indicate the presence of psychopathy. The psychometric properties of this instrument have been confirmed in numerous studies reporting high correlations with the original scale *The Hare Psychopathy Checklist-Revised* (PCL-R; Hare, 1991) and adequate cross-cultural reliability (Cooke, Michie, Hart, & Clark, 2005). The PCL:SV has been shown to be the most appropriate instrument to measure prototypical psychopathic facets in forensic populations (Cooke, & Michie, 1999) and includes two robust factors that capture the interpersonal/affective and antisocial/unstable behaviour traits of psychopathy. A random sample of 16 patients was rated independently by an experienced psychologist and the intra-class correlation for the total scores was high 0.84.

The HCR-20 and the PCL-SV were completed by psychologists trained in the use of both instruments for each patient based on information from a clinical interview and files.

Conduct Disorder. Information on childhood characteristics was collected from files and interviews with each participant, using the Conduct Disorder module of the Structured Clinical Interview for DSM-IV (SCID-II) (First, Gibbon, Spitzer, Williams, & Benjamin, 1997). In addition we used multiple sources of information (medical records, files, and interviews with family members and social workers) to assess symptoms of CD prior to age 15. A diagnosis of CD was coded as present or absent.

Ethical approval. The study was approved by the ethics committee of the forensic psychiatric hospital.

Statistical Analysis

Data were analysed using SPSS for the Social Sciences version 20. Socio-demographic, clinical, criminal histories, and HCR-20 and PCL:SV scores of violent offenders with SMI+CD and with SMI-CD were compared using chi-square tests for the categorical variables, Student's *t*-tests for normally distributed continuous variables and the Mann-Whitney *U* for skewed continuous variables. Six forward stepwise logistic regression analyses were then performed to examine the multivariate relationships of scores on HCR-20, PCL:SV and socio-demographic variables with SMI+CD. The dependent variable was coded 0 for participants with SMI-CD and 1 for those with SMI+CD. Model 1 estimates the independent contribution of the total HCR score to group SMI+CD. Model 2 estimates the independent contribution of the H, C, and R scores to SMI+CD, while Model 3 estimates the association of the total PCL:SV score with SMI+CD. Model 4 estimates the independent contribution of the total PCL:SV factor 1 and 2 scores with SMI+CD. Because some of the symptoms of the CD could be captured by the risk assessment instruments, the analyses of these models were conducted leaving out possible confounders (young age at first violent incident and early maladjustment), both part of the H scale of the HCR-20 and juvenile delinquency, part of the PCL: SV. To test the collinearity between confounders, we used the Collin Command in Stata. We found no evidence of collinearity (the mean of variance was 3.05) while a mean variance inflation factor above 10 is considered indicative of significant collinearity (Chen, Ender, Mitchell, & Wells, 2009).

Finally, models 5 and 6 were computed to determine whether variables that were significantly associated with SMI+CD and SMI-CD at univariate level $p < .05$ (current personality disorder, age at first offence, low education level, rule breaking within the institution, and family psychiatric history) were independently associated with SZ+CD,

as opposed to SZ-CD, after controlling in model 5 for the total HCR score and in model 6 for the PCL:SV score.

RESULTS

Comparisons of severely mentally ill offenders with and without Conduct Disorder prior to age 15

Insert Table 1 about here

Comparisons of the severely mentally ill violent offenders with and without CD are presented in Table 1. No significant differences were observed regarding age, marital status, primary diagnosis, or family history of mental disorders. Fewer of the participants with CD than those without CD, had completed secondary school, more had a co-morbid personality disorder, and a history of substance misuse. Those with CD prior to age 15 had been first convicted of a criminal offence at a younger age, had acquired more had convictions prior to the judgement of insanity, had experienced physical abuse as a child, presented hyperactivity in childhood, had relatives with mental disorders, acquired a greater number of convictions, and proportionately more of their relatives had a history of criminality. Additionally, proportionately more of those with CD than those without had breached institutional rules.

Comparison of HCR-20 and PCL: SV scores of violent offenders with SMI+CD and violent offenders with SMI-CD

Insert Table 2 about here

As presented in Table 2, violent offenders with SMI+CD obtained significantly higher HCR-20, H, R, PCL: SV, and PCL factor 1 and 2 scores than the violent offenders with SMI-CD.

Insert Table 3 about here

The results of the logistic regression analyses are shown in Table 3. In Model 1, the total HCR-20 score was positively associated with SMI+CD. In Model 2, the H score was independently, and positively, associated with SMI+CD, while C scores were independently and negatively associated with SMI+CD, and the R score was not significantly associated. In Model 3, the total PCL:SV score was significantly associated with SMI+CD. In Model 4, factor 2 scores were positively associated with SMI+CD, while factor 1 scores showed no association. Six predictor variables were entered into Model 5: total HCR-20 score, personality disorder, age at first offence, low educational level, rule breaking within institution and family psychiatric history. The model indicated that the HCR-20 total scores, a comorbid personality disorder, and low educational level were independently associated with SMI+CD, while age at first offence, rule breaking within institution, and family psychiatric history were not. A final Model included the total PCL:SV score and the significant variables that distinguished the violent offenders with and without CD at univariate level. The model showed that scores on the PCL:SV and low educational level were significantly associated with SMI+CD. However, personality disorder, age at first offense, and rule breaking within institution, did not significantly contribute to the regression model. The wide confidence intervals for the odds ratios in these models indicate that these findings should be carefully interpreted.

DISCUSSION

This study compared HCR-20 and PCL: SV scores of violent offenders with SMI with and without a history of CD prior to age 15. In univariate comparisons, patients with SMI+CD as compared to those without CD were more likely to have been convicted of violent crimes prior to the index offence that lead to the judgement of insanity and to have engaged in breaches of hospital rules. However, in regression models, after taking account of either the HCR-20 score or the PCL:SV score, neither of these factors were associated with SMI+CD.

As hypothesized, violent offenders with SMI+CD obtained higher total HCR-20 scores. Further, in the regression model that included the three HCR sub-scales, the total H scores were independently and positively associated with SMI+CD confirming past studies showing that among men with schizophrenia or SMI the presence of CD prior to age 15 was associated with persistent pattern of criminality through middle age (Hodgins, et al, 2005; Hodgins et al., 2008; Swanson et al., 2006). However, C scores on HCR-20 were negatively associated with SMI+CD, suggesting that these patients were less symptomatic than those with SMI-CD. We hypothesized that these offenders with SMI+CD commit their first offence prior to treatment for psychosis, and they go on to commit more offences than those offenders without CD. However, despite the fact that they are more persistent offenders, they are more clinically stable and they spend less time in the institution due to that they are convicted for less severe violent crimes. However, this hypothesis was not tested due to the small size of the sample. The lack of association of the R score with SMI+CD is also surprising, given the evidence that those with prior CD are more likely than others to commit future violent crimes and to engage

in aggressive behaviour. The finding may be due to the fact that patients were not being considered for discharge at the time of the study.

In the present study, violent offenders with SMI+CD obtained higher PCL:SV total scores than did violent offenders with SMI-CD. This is similar to a previous finding showing that among forensic patients PCL-R scores correlated with a diagnosis of Antisocial Personality Disorder (Hart & Hare, 1989). In regression model examining the independent contributions of PCL:SV factors 1 and 2 to SMI+CD or SMI-CD, only factor 2 was found to be associated with SMI+CD. This finding indicates that the elevated PCL:SV scores result from the severity of antisocial/unstable behaviour traits, rather than from the interpersonal/affective traits of psychopathy. These results are also consistent with results from previous studies that demonstrated that factor 2 of PCL:SV is more strongly related to violent offending than factor 1 (Guy, Edens, Anthony, & Douglas, 2005; Leistico, Salekin, DeCoster, & Rogers, 2008; Belfrage, Fransson, & Strand, 2000; Salekin, Rogers, & Sewell, 1996).

In the present study, primary diagnoses of patients with and without prior CD were similar, consistent with previous studies (Moran & Hodgins, 2004), but the proportion of patients with delusional disorder was higher among the violent offenders with no history of CD than among those with CD. However, this difference was not statistically significant, due to the small number of patients with this diagnosis. In a study conducted in Canada, delusional disorder was found to be much more common among prison inmates than in a sample of patients recruited in a psychiatric hospital (Côté, Lesage, Chawky & Loyer, 1997). Delusional disorder may be associated with violent behaviour but not surprisingly given the symptoms of the disorder, few studies have examined this possibility. Importantly, almost two-thirds of the violent offenders who had presented CD prior to age 15 received a clinical diagnosis of a personality disorder. Consistent

with previous studies, proportionately fewer of the violent offenders with SMI+CD than those with SMI-CD completed high school, while proportionately more presented hyperactivity and reported having experienced physical abuse in childhood. Physical abuse is a precursor of both schizophrenia (Bendall, Jackson, Hulert, & McGorry, 2008; Morgan & Fisher, 2006; Read, vanOs, Morrison, & Ross, 2005) and CD (Murray & Farrington, 2010; Stouthamer-Loeber, Loeber, Homish, & Wei, 2001; Widom, 1989). Further, the families of the violent offenders with SMI+CD included proportionately more individuals with criminal convictions and mental disorders, consistent with previous reports (Fazel, Langstrom, Hjern, Grann, & Lichtenstein, 2009; Hodgins, 2008). In regression models, after taking account of either the HCR-20 or PCL:SV total score, only a comorbid personality disorder and low education were associated with SMI+CD.

In the present study, proportionately more of the violent offenders with SMI+CD than those with SMI-CD had a history of substance misuse. This is to be expected since prospective longitudinal studies have shown that children and adolescents with CD are exposed earlier to alcohol and drugs and begin misusing these substances at a young age (Robins & McEvoy, 1990). Importantly, much evidence now indicates that among individuals who are genetically vulnerable for schizophrenia, heavy cannabis use in early adolescence promotes the onset of psychosis (Di Forti et al., 2012). A recent study of a sample of patients experiencing their first episode of schizophrenia indicated that the presence of CD increased the likelihood of heavy cannabis use in early adolescence (Malcolm et al., 2011).

Clinical implications

The results of the present study have relevant clinical implications for mental health services. Among men with severe mental illness antipsychotic medication is

essential for treating the symptoms of schizophrenia. However, once positive symptoms have been reduced, other factors such as prior CD and aggressive behaviour continue to be associated with elevated scores on risk assessment tools. In order to reduce violence, strategies are required to change what are life-long patterns of aggressive behaviour. Individuals with schizophrenia and high levels of violence require treatments that promote compliance and reduce their long-standing antisocial and aggressive behaviours. New behaviours and ways of thinking are needed, as are prosocial skills especially problem solving skills. Psychoeducation promotes knowledge of schizophrenia and the necessity of neuroleptic medications. Cognitive-behavioural treatments within institutions show promise in reducing antisocial and aggressive behaviours (for a review see Kolla & Hodgins, 2013). A recent study showed that prior CD was associated with a failure to complete such an intervention (Cullen, Soria, Clarke, Dean, & Fahy, 2011) again highlighting the need for interventions aimed at promoting engagement in treatment in this sub-group of patients. As such interventions are labour intensive and costly, it is essential to identify the patients with SMI+CD who are most in need and likely to benefit from them.

Strengths and limitations

The study examined a sample of violent offenders with SMI who had been judged not guilty by reason of insanity and sent to treatment in a forensic hospital in Spain. Information was collected from multiple sources including the patients themselves, family members, criminal and medical files. The HCR-20 and PCL:SV were administered and scored by psychologists trained to use these instruments and inter-rater reliability was high for both. Limitations include the focus on men only, a small sample size not allowing for statistical comparisons, and a lack of clear information about whether childhood hyperactivity was not present or was not assessed.

Conclusions

Results suggest that the elevated scores on the risk assessment scales among patients with SMI vary by the presence of a history of antisocial behaviour in childhood. The presence of CD prior to age 15 was associated with higher total HCR-20 and PCL:SV scores. These elevations on scores resulted from elevations in scores on the H scale and factor 2, both of which assess a history of antisocial and aggressive behaviours.

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Table1. Comparisons of severely mentally ill violent offenders with and without Conduct Disorder prior to age 15

	Violent offender		
	SMI+CD (N=22)	SMI-CD (N=66)	Test
Age	M=41.8 SD=8.7	M=43.3 SD=9.8	Mann-Whitney *U*, z =-5.50, *p* =0.582
Marital status %			
Single	15 (68.2)	52 (78.8)	
Married	2 (9.1)	5 (7.6)	
Separated/Divorced	5 (22.7)	9 (13.6)	
Accommodation %			
Living alone	7 (31.8)	13 (19.7)	
Couple	1 (4.5)	12 (18.2)	
Family	9 (40.9)	36 (54.5)	
Others	5 (22.5)	5 (7.6)	
Education level %			
Primary school	19 (86.4)	33 (50.0)	
Secondary education	3 (13.6)	28 (42.4)	
College or above		5 (7.6)	
Primary Diagnosis %			
Schizophrenia	15 (68.2)	44 (66.7)	
Delusional disorders	1 (4.5)	13 (19.7)	
Schizo-affective-disorder	2 (9.1)	5 (7.6)	
Other psychotic disorders	3 (13.6)	2 (3.0)	
Bipolar disorder	1 (4.5)	2 (3.0)	
Comorbidity %			
Current personality disorder	15 (68.2)	11 (16.7)	χ^2 (*n* 88)=18.63, *p*<.001
Current substance misuse	3 (13.6)	5 (7.6)	
History of substance misuse	22 (100)	35 (53.0)	χ^2 (*n* 84) = 14.11, *p*<.001
Criminal history			
Mean age at first offense	M=27.7 SD=9.2	M=36.7 SD=12.6	Mann-Whitney *U*, z = -2.11, *p*=0.035
Rule breaking within the hospital	14 (63.6)	19 (28.8)	χ^2 (*n* 88)=7.12, *p*=0.004

Prior conviction %	18 (81.80)	14 (21.2)	χ^2 (n 88)=26.19, $p < .001$
For at least one violent-crime	17 (77.3)	13 (19.7)	χ^2 (n 88)=24.72, $p < .001$
For at least one non-violent crime	1 (4.5)	1 (1.5)	
Index offences %			
Murder	4 (18.2)	20 (30.3)	
Attempted murder	1 (4.5)	9 (13.6)	
Homicide	2 (9.1)	11 (16.7)	
Attempted homicide	2 (9.1)	11 (16.7)	
Threats	5 (22.7)	2 (3.0)	
Injuries	1 (4.5)	3 (4.5)	
Sexual assault	1 (4.5)	2 (3.0)	
Robbery	1 (4.5)		
Other violent offenses	5 (22.6)	8 (12)	
Victim %			χ^2 (n 88)= 2.07, p=0.120
Family member or known	12 (54.5)	47 (71.2)	
Unknown	10 (45.5)	19 (28.2)	
Physical abuse in childhood %	10 (45.5)	3 (4.5)	
Hyperactivity in childhood %	11 (50.0)		
Family psychiatric history %			χ2 (n 80)= 5.244, p=0.022
Yes	14 (63.6)	27 (40.9)	
No	4 (18.2)	35 (53.0)	
Family criminal history %			
Yes	4 (18.2)	3 (4.5)	
No	8 (36.4)	55 (83.3)	
Unknown	10 (45.5)	8 (12.1)	

N.B. For some variables, numbers of participants in each cell were too small to allow for statistical comparisons.

Table 2. Comparisons of HCR-20 and PCL:SV scores of severely mentally ill violent offenders who presented conduct disorder before age 15 and those who did not

	Violent Offenders					
	SMI+CD (N=22)		SMI-CD (N=66)			
	M	SD	M	SD	t (88)	*p*
HCR Total	25.09	4.7	15.2	6.5	-6.536	<.001
HCR- H	14.7	2.3	6.6	2.9	-12.048	<.001
HCR- C	4.5	2.2	4.2	2.8	-0.601	0.548
HCR- R	6.4	2.6	4.4	2.2	-3.406	<.01
PCL:SV Total	14.4	3.3	6.7	4.1	-3.749	<.001
Factor 1	5.3	2.4	2.9	2.2	-6.443	<.001
Factor 2	9.1	1.3	3.9	2.3	-5.887	<.001

SMI+CD: severe mental illness and conduct disorder prior to age 15
SMI-CD: severe mental illness with no conduct disorder

Table 3. Relationship of HCR-20, PCL: SV scores and multiple variables with the presence of conduct disorder before age 15 among violent offenders with severe mental illness.

	B	SE	Wald	*p*	OR (IC 95%)
Model 1					
HCR-20 Total	0.242	0.059	16.714	<.001	1.27 (1.13-1-43)
Model 2					
HCR-H	1.800	0.550	10.705	.0001	6.05 (2.06-17.77)
HCR-C	-0,983	0.451	4.738	0.029	0.37 (0.16-0.91)
HCR-R	0.473	0.360	1.727	0.189	1.61 (0.79-3.25)
Model 3					
PCL:SV Total	0.413	0.095	18.764	<.001	1.51 (1.25-1.82)
Model 4					
PCL Factor 1	-0,034	0.180	0.036	0.849	0.97 (0.68-1.38)
PCL Factor 2	0.912	0.222	16.389	<.001	2.49 (1.61-3.85)
Model 5					
HCR-20 Total	0.278	0.078	12.749	<.001	1.32 (1.13-1.54)
Personality disorder	3,384	1.322	6.553	0.010	29.50 (2.21-393.65)
Age at first offence	-0.186	0.106	3.091	0.079	0.83 (0.68-1.02)
Low education level	1.805	0.843	4.587	0.032	6.08 (1.17-31.70)
Rule breaking institution	0.264	0.752	0.123	0.725	1.30 (0.30-5.69)
Family Psychiatric history	-1,287	1.209	1.134	0.287	0.28 (0.03-2.95)
Model 6					
PCL:SV	0.532	0.145	13.383	<.001	1.70 (1.28-2.26)
Personality disorder	3.791	3.528	3.528	0.060	44.29 (0.85-2313.46)
Age at first offense	-0,247	2.609	2.609	0.106	0.78 (0.58-1.05)
Low education level	2.469	1.003	6.064	0.014	11.81 (1.66-84.32)
Rule breaking institution	0.774	0.808	0.918	0.338	2.17 (0.45-10.56)
Family psychiatric history	-1,826	0.543	0.543	0.461	0.16 (0.00-20.71)