

Assessing Risk for Aggression in a Forensic Psychiatric Hospital Using the Level of Service Inventory-Revised: Screening Version

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The assessment of risk for aggression has become a central concern of many mental health services. Some structured schemes for guiding risk assessment, developed primarily to assess risk in psychiatric patients discharged from hospital and offenders being considered for release from prison, have recently been trialled in the inpatient setting. Against the background of some prior research demonstrating the potential benefits of structured assessment schemes, and some concerns about the practicality of these schemes for assessing risk in inpatients, the current research was initiated to assess the effectiveness of the Level of Service Inventory-Revised: Screening Version (LSI-R: SV) in the prediction of aggression within a forensic psychiatric hospital. Results showed that only a weak association between the LSI-R: SV total score and inpatient aggression existed. This is probably because the LSI-R: SV addresses more static variables and does not assess the clinical characteristics and recent hostility that is associated with aggression in psychiatric patients. The predictive validity of the LSI-R: SV in this context is therefore limited. There might be more effective schemes, some of which were designed specifically for the purpose of assessing inpatient aggression that should be used in preference to the LSI-R: SV.

Risk assessment schemes that purportedly assist clinicians identify high-risk patients have been the focus of considerable international research attention over the last two decades. Although this research has primarily focussed on long-term risk prediction in patients discharged from hospital to the community (McNiel & Binder, 1991), a number of these schemes, including the Violence Risk Appraisal Guide (VRAG) (Webster, Harris, Rice, Cormier, & Quinsey, 1994), Psychopathy Checklist: Screening Version (PCL: SV) (Hart, Cox & Hare, 1995), Psychopathy Checklist (PCL) (Hare, 1980), Psychopathy Checklist-Revised (PCL-R) (Hare, 1991) and the HCR-20 (Webster, Douglas, Eaves, & Hart, 1997) have recently been trialled in the inpatient setting. In summary, these studies have shown relatively consistent results with relationships between the various measures and inpatient aggression demonstrated (Doyle, Dolan, & McGovern,

2002; Gray et al., 2003; Heilbrun et al., 1998; Hill, Rogers & Bickford, 1996; McNiel, Gregory, Lam, Binder, & Sullivan, 2003; Nicholls, Ogloff, & Douglas, 2004). Instruments that assist in the dynamic appraisal of risk for imminent aggression including the Dynamic Appraisal of Situational Aggression: Inpatient Version (DASA: IV) (Ogloff & Daffern, 2002) and the Broset Violence Checklist (BVC) (Almvik, Woods, & Rasmussen, 2000) have also been developed and may assist in the day to day assessment of risk.

Against this background we decided to examine whether the Level of Service Inventory-Revised: Screening Version (LSI-R: SV) (Andrews & Bonta, 1998) might similarly show a relationship with inpatient aggression and therefore be adopted as a risk assessment instrument in a forensic psychiatric hospital. The LSI-R: SV is an eight item paper and pencil checklist derived from the 54-item Level of

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Service Inventory-Revised (LSI-R) (Andrews & Bonta, 1995), which measures risk for criminal recidivism and criminogenic needs (Ogloff & Davis, 2004). Although it was not designed to predict aggression by psychiatric patients during inpatient treatment, the LSI-R: SV is based on an extensive body of knowledge on the risk factors and criminogenic needs of offenders (Andrews & Bonta, 1995) and has been shown to predict institutional misconduct in non mentally disordered offenders (Kroner & Mills, 2001), "inprogram recidivism (including charges pending and reconvictions), multiple reconvictions, success in correctional halfway houses, and misbehaviours whilst incarcerated" (Andrews & Bonta, 1998, p. 20).

To our knowledge the LSI-R: SV has not been tested in the assessment of risk for aggression in civil or forensic psychiatric inpatient settings. Although designed for use with mainstream offender populations, there is some evidence that the LSI-R and LSI-R: SV have moderate to strong levels of predictive validity with forensic psychiatric patient populations. For example, Rice and Harris (1992) retrospectively studied a group of 96 individuals with schizophrenia who were found not guilty by reason of insanity and were admitted over a seven year period (1975-1981) to a maximum security hospital in Canada. Their results indicated that patient scores on the LSI-R correlated significantly with both non-violent and violent recidivism ($r = .31, p < .001$ and $r = .23, p < .05$, respectively). Similarly, Ferguson, Ogloff & Thomson (2005) have found that the LSI-R: SV is strongly related to recidivism in mentally ill offenders who have been treated in a forensic psychiatric hospital and then released to the community. These findings are unsurprising given research has indicated that risk and needs factors are generally the same for mentally disordered and non-disordered offenders (Bonta, Law, & Hanson, 1998).

Although no research has investigated the relationship between the LSI-R: SV and aggression among mentally ill offenders in a forensic hospital, if a positive relationship existed, the LSI-R: SV would offer some advantages over measures such as the PCL-R, PCL: SV and HCR-20. First, the LSI-R: SV has less restrictive test user requirements than the VRAG, PCL-R, PCL: SV and HCR-20. It can be administered by nursing staff, who normally take the initiative in the initial assessment of risk for

aggression on a patient's admission. Further, in addition to a relative ease of scoring, the LSI-R: SV is not hampered by the time constraints associated with these other measures. These measures may be impractical in the inpatient setting given the very brief length of stay that is common in contemporary acute psychiatric wards. There is often a need for immediate appraisal of patients' potential for violence based on little information. Several inpatient risk assessment studies have been conducted retrospectively from file review rather than tested in a manner consistent with the real task of risk assessment in the clinical setting. Administration of the LSI-R: SV takes only 15-20 minutes. The LSI-R: SV may therefore, in conjunction with clinical considerations, be used on admission to ascertain the likelihood that a patient will be aggressive during their admission. The assertiveness of intervention, placement and management decisions might be informed by assessment of risk. As the LSI-R: SV contains some dynamic items it may also be used to determine changes in risk level over the course of an admission.

METHOD

Setting

The setting for this project was the Thomas Embling Hospital (TEH), the secure inpatient hospital of the Victorian Institute of Forensic Mental Health, located in Melbourne, Australia. The TEH provides psychiatric assessment and treatment for prisoners with a serious mental illness requiring secure involuntarily hospital treatment, people detained as being unfit to plead or not guilty because of mental impairment, offenders or alleged offenders referred by courts for psychiatric assessment and/or treatment, and people with serious mental illness referred from general mental health services who are a risk to the community. At the commencement of the study, the TEH consisted of an acute care program comprising 40 beds across three wards (two 15 bed male acute wards and a 10 bed female acute ward) and a continuing care program comprising a 20 bed continuing care ward and a 20 bed intensive psychosocial rehabilitation ward. On October 9, 2002, a third 20 bed rehabilitation ward was opened.

All patients admitted to the TEH during 2002 or residing there on January 1 2002 were included in the study. A total of 232 patients were admitted during this period. Patients ranged in age from 17 to 83 years ($M = 34.52$, $SD = 12.6$, $Median = 31.10$ years). One hundred and ninety three patients were male and 39 were female. Diagnosis was identified from discharge summaries completed by psychiatric registrars. For patients remaining in the hospital on December 31, 2002, the working diagnosis was obtained through interview with the psychiatric registrar responsible for the patient's care. The most common diagnosis was Schizophrenia ($n = 173$ or 74.57%). Disorders characterised by the presence of psychotic symptoms, including Schizophrenia ($n = 173$ or 74.57%), Paranoid Psychosis ($n = 2$ or 0.87%), Schizoaffective Disorder ($n = 8$ or 3.49%), Delusional Disorder ($n = 3$ or 1.31%), Brief Reactive Psychosis ($n = 1$ or 0.44%), Drug Induced Psychosis ($n = 4$ or 1.75%), Depression with Psychotic Features ($n = 5$ or 2.18%), Psychosis Not Otherwise Specified ($n = 3$ or 1.31%), and Psychosis of Organic Origin ($n = 2$ or 0.87%), were most common ($n = 201$ or 86.64%). Affective disorders (not including Schizoaffective Disorder) including Bipolar Affective Disorder ($n = 4$ or 1.75%), Hypomania ($n = 1$ or 0.44%), Depression ($n = 7$ or 3.06%) and Dysthymia ($n = 2$ or 0.87%) were recorded on 14 (6.11%) occasions. Personality disorders including Borderline Personality Disorder ($n = 5$ or 2.18%) and Antisocial Personality Disorder ($n = 4$ or 1.75%), were recorded on nine (3.93%) occasions. A number of other diagnoses were also recorded, including Adjustment Disorder ($n = 1$ or 0.44%), Asperger's disorder ($n = 2$ or 0.87%), Huntington's disease ($n = 1$ or 0.44%), and Dementia ($n = 1$ or 0.44%). No diagnosis was recorded for three patients.

Procedure

The Level of Service Inventory-Revised: Screening Version (LSI-R: SV) was scored through interview conducted by experienced clinical forensic psychologists working within the TEH and file review conducted by two postgraduate students in forensic psychology. Interviews were conducted during the year 2002. Some patients were not able to be interviewed so their LSI-R: SV score was obtained exclusively through file review after 2002.

The LSI-R: SV is a paper and pencil instrument consisting of eight items rated by the administrator (Andrews & Bonta, 1998). The items are: Item 1: 'Two or more prior adult convictions', Item 2: 'Arrested under age 16', Item 3: 'Currently unemployed', Item 4: 'Some criminal friends' (Does the person have friends who have a criminal record or involved in criminal activity?), Item 5: 'Alcohol/drug problem: School work' (Does the person have a current alcohol or drug problem which interferes with academic achievement and/or work performance?), Item 6: 'Psychological assessment indicated' (Has the person been assessed by a psychologist in the last year or is there any indication of a range of psychological problems as outlined in the user's manual?), Item 7: 'Non-rewarding, parental', and Item 8: Attitudes/orientation: Supportive of crime'. The LSI-R: SV total score is obtained by summing the items. These total scores can be used to assess the level of risk and needs relative to other inmates or probationers, with the range 0 to 2 indicating minimum risk/needs, 3 to 5 indicating medium risk/needs and 6 to 8 indicating maximum risk/needs. The psychometric properties of the LSI-R: SV are well established (Andrews & Bonta, 1998).

Aggressive incidents occurring during 2002 were recorded using an adapted version of the Overt Aggression Scale (OAS) (Silver & Yudofsky, 1987). This scale categorises aggressive behavior into verbal aggression, physical aggression against objects, physical aggression against self and physical aggression against other people. Within each category aggressive behaviors are arranged hierarchically according to severity. For the purpose of this study, an aggressive episode was defined as the occurrence of any behavior listed on the adapted OAS. In this version of the OAS, items relating to physical aggression against self were eliminated. The severity of an aggressive behavior was ranked with physical aggression towards others the most severe form of aggression with property damage the least severe. All ward staff were trained in how to record incidents of aggression and were instructed to record an incident either after it occurred or when reviewing their patients at the completion of a shift. Where several forms of aggression occurred during one incident (e.g., verbal and physical aggression), the most severe form of aggression was rated. The name

of the aggressive patient, the date aggression occurred, whether the victim of aggression was a patient or a member of staff, and the ward location were also recorded at the time of the aggressive incident or through review of patient notes and interview by the first author (MD) with ward staff, which occurred following each aggressive behavior. The first author (MD) visited each ward at least three times every week and provided support and encouragement to ward staff to ensure they remained mindful of the project and recorded aggressive behaviors reliably.

In this study an 'aggressive' patient was one who recorded at least one of the aggressive behaviors recorded by the OAS during their admission. As there may be some differences in the characteristics associated with patients who are physically aggressive compared with those who may be verbally aggressive or aggressive to property (Gray et al., 2003), further analyses were conducted whereby patients were classified as violent if they were responsible for at least one physically aggressive behavior or non-violent if they did not record any aggressive behaviors or recorded only verbally aggressive behaviors or damage to property. Data were analysed using SPSS for Windows version 12.01.

Several analyses of the data were performed to assess the predictive ability of the LSI-R: SV. Initial t-tests were conducted to compare total LSI-R: SV scores with aggressive and non-aggressive patients and then violent with non-violent patients. The frequency of aggressive and violent behaviors was then correlated with the LSI-R: SV total scores using a nonparametric correlation (Spearman's rho). The receiver operating characteristics analysis, which allows for an area under the curve (AUC) to be obtained, was also conducted. The area under the curve of a receiver operating characteristics analysis refers to the likelihood that a randomly selected truly aggressive patient would have received a higher score on the predictive tool, the LSI-R: SV, than a randomly selected truly non-aggressive patient. According to Nicholls, Ogloff and Douglas (2004) AUC's in the range of 0.75 to 0.80 are considered moderate to large effect sizes.

This study is part of a larger project, some results of which have been reported elsewhere (Daffern, Ogloff, & Howells, 2003; Daffern, Howells, Ogloff, & Lee, in press). Note. I deleted this as it is now reported as it is under submission. Also, it is not proper to name the journal in which the paper is under review.

RESULTS

During the 12 months of the study, there were 502 aggressive behaviors recorded. Overall, 105 of the 232 patients admitted (45.26%) were aggressive on at least one occasion, 34.1% of patients were violent. Of those patients who were aggressive, 36.2% were aggressive on one occasion. Most (81.9%) aggressive patients were aggressive on fewer than six occasions. A small number of patients (8) who were each aggressive on 15 or more occasions were responsible for 216 (43.03%) aggressive behaviors.

Predicting Aggressive Behavior

LSI-R: SV scores were obtained for 175 patients, with scores ranging between 1 and 8 with a mean of 4.54, standard deviation of 1.49, and median of 4. According to the maximum, medium and minimum risk/needs rating guidelines, 14 (8%) patients administered the LSI-R: SV were rated as minimum risk/needs, 113 (64.6%) patients were rated as medium risk/needs, and 48 (27.4%) were rated as maximum risk/needs. Aggressive patients had a significantly higher LSI-R: SV score ($M = 4.85$, $SD = 1.459$) when compared with non aggressive patients ($M = 4.27$, $SD = 1.469$), $t(173) = 2.593$, $p = .010$. Violent patients had a higher LSI-R: SV score ($M = 4.87$, $SD = 1.490$) when compared with non aggressive patients ($M = 4.37$, $SD = 1.465$), $t(173) = 2.137$, $p = .034$. The correlation between the number of aggressive behaviors and the LSI-R: SV total score was not statistically significant ($r = .105$, $p = n.s.$, $n = 175$) nor was the correlation between the number of violent behaviors and the LSI-R: SV total score ($r = .081$, $p = n.s.$, $n = 175$). The AUC for the LSI-R: SV was .60 for any aggression and .59 for violence.

DISCUSSION

Results of this study suggest that the LSI-R: SV total score was only weakly associated with inpatient aggression. The predictive validity of the LSI-R: SV in this context is therefore limited. Although aggressive and violent patients scored higher on the LSI-R: SV than non-aggressive and non-violent patients, there was no relationship between the number of aggressive and violent incidents and the LSI-R: SV and the AUC is clearly less than that accepted as moderate. It is possible that the items assessed by the LSI-R: SV failed to discriminate between aggressive and non aggressive psychiatric inpatients, many of whom had at least a moderate level of criminogenic needs and approximately half of whom were aggressive on at least one occasion. The LSI-R: SV may fail to discriminate between patients in some psychiatric hospitals because of the high base rate of some clinical phenomena, past behaviors and demographic characteristics. For example, item 6: 'Psychological assessment indicated' would be scored 'Yes' for most forensic and civic psychiatric inpatients, who are primarily admitted for the treatment of a psychotic illness. Like some other schemes developed for assessing chronic risk the LSI-R: SV also fails to measure, with the exception of item 6: 'Psychological assessment indicated', the clinical characteristics (i.e. acute psychotic symptoms) and recent hostility that are commonly associated with inpatient aggression (Daffern et al., in press). These need to be incorporated into structured assessment systems developed to support violence risk decision making in acute psychiatric settings.

The lack of correlation between LSI-R: SV and number of aggressive and violent incidents may be because there were few patients who were repeatedly aggressive during the study period and that those patients who were repeatedly aggressive had clinical and demographic characteristics that were unusual even within this population (see Daffern et al., in press). For example, repeatedly aggressive patients were more likely to have a non psychotic illness, were more likely to be female, and less likely to have a history of poly-substance use across the lifetime when compared with infrequently aggressive patients.

Although the LSI-R: SV showed only a weak relationship with inpatient aggression, we have persisted with a further trial where we will assess the effectiveness of the LSI-R: SV during a prospective study of risk assessment for inpatient aggression in the TEH. Further research might also consider whether the LSI-R: SV is a more discriminative, and therefore effective, initial structured screening instrument in mainstream acute psychiatric wards, where patients with a high level of criminogenic needs, and therefore higher risk, are less common than in the forensic psychiatric hospital. It is possible that item 1: 'Two or more adult convictions', item 2: 'Arrested under age 16', item 4: 'Some criminal friends' and item 8: 'Attitudes/orientation: Supportive of crime' are less common in civil psychiatric populations.

In concluding, there is an accumulating evidence base in support for two styles of risk assessment in the inpatient setting, those assessments schemes such as the HCR-20, Violence Screening Checklist (VSC; McNiel & Binder, 1994), VRAG, PCL and its derivatives, which allow for patients at an increased risk of behaving aggressively at some stage during their admission to be identified, as well as risk assessments for imminent aggression such as the Dynamic Appraisal of Situational Aggression: Inpatient Version (DASA: IV) (Ogloff & Daffern, 2002) or the Broset Violence Checklist (BVC) (Almvik et al., 2000). Both approaches are empirically supported and may be required. In practice, risk assessments might be conducted on admission using instruments such as the HCR-20, VSC, PCL: SV or VRAG. Those patients identified as a moderate to high risk level would then be assessed daily during their admission using a dynamic appraisal system designed for the prediction of imminent aggression. Further research is clearly required to determine the most effective and parsimonious method of risk assessment for aggression in psychiatric inpatient settings although this research indicates that instruments which do not include assessment of clinical characteristics may lack utility. It is likely that the utility of different risk assessment instruments will be influenced by the base rate of various contributing clinical phenomenon, demographic characteristics and historical factors of individual patients in addition

to the treatment regime, specifically the admission and discharge practices of each psychiatric hospital.

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