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Course and Predictors of Physical Aggressive Behaviour after Discharge from a Psychiatric Inpatient Unit: 1 Year Follow-up

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Abstract The present study analyzes course and predictors of physically aggressive behaviour over a 1-year follow up in a sample of patients discharged from a psychiatric inpatient unit. One hundred and eighty-six patients discharged from a locked short-term Psychiatric Inpatient Unit at the Bologna University Hospital. After discharge, two data collection contacts at 1 month and at 1 year were scheduled. In particular, psychiatrists, nurses, and other professionals were interviewed by the research staff using the Overt Aggression Scale. About 20 % of discharged patients showed physical aggressiveness in subsequent follow-up contacts. Risk factors for physical violence in the short-time period were social problems and a longer time from the first psychiatric contact. Living in residential facilities and physical aggressiveness during hospitalization were correlated to violence in the long-time period. Risk factors for physically violent behaviour differed in the short-term and long-term follow-ups; different causes of violent behaviour could be hypothesized.

Keywords Violence · Aggressive behaviour · Predictors · Mental disorders

Introduction

The potential for adults with serious mental illness to be violent in community and clinical settings is a growing concern. However, only a small number of patients suffering from mental disorders behave violently and a smaller percentage of these show persistent aggressiveness (Walsh et al. 2002). The vast majority of the acts of violence are minor, while serious violence is rare (Nijman et al. 2005; Grassi et al. 2006). Nevertheless, mild forms of aggression such as violence against inanimate objects or verbal threats frequently precede physical assaults and, therefore, may be indicators of future assaultive behaviour (McNiel and Binder 1989).

One of the most important tasks of psychiatrists working in the mental health services is to assess and manage patients who are considered to be at risk of doing harm to others (Anderson et al. 2004). In particular, clinicians should be able to predict violent behaviour of psychiatric patients with a sufficient degree of accuracy in order to prevent aggression either in the hospital or in the community after discharge. In general psychiatry, most studies in clinical samples assessed violence before and during hospitalization (Choe et al. 2008) or in a short post-discharge follow-up (Tardiff et al. 1997; Silver et al. 1999; Monahan et al. 2000, 2005). In literature, important predictive factors for short-term aggressive behaviour are: violence that precedes admission (Tardiff et al. 1997; Arango et al. 1999); high re-admission rate and involuntary hospitalization (Nijman et al. 2002); poor insight (Arango et al. 1999); a history of one or more violent episodes at some time in the past (Tardiff et al. 1997) and substance abuse (Walsh et al. 2004). Other studies show a strong correlation between substance abuse and aggressiveness (Swartz et al. 1998). It seems that the association between major mental disorders and violent behaviour may be strengthened by comorbidity with substance abuse. A demonstration of this effect was provided in a longitudinal prospective study of a population-based cohort of 644

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individuals with schizophrenia in Sweden (Lindqvist and Allebeck 1990). Thirty-eight of these patients were responsible for 71 violent offenses between 1972 and 1986. Fourteen of these offenders abused alcohol and/or drugs, and other seven were probable abusers. Similar effects were demonstrated in the United States (Swartz et al. 1998).

On the contrary, very few studies investigated violent behaviour and its predictors in a long-term follow-up after discharge. The majority of studies on long-term follow-up of discharged patients were done on groups of patients at very-high risk of violence: adolescent psychiatric inpatients (Kjelsberg and Dahl 1999), patients discharged from forensic psychiatric services (Davies et al. 2007), civilly committed psychiatric patients (Douglas et al. 1999), male violent offenders with a diagnosis of schizophrenia convicted of a violent crime (Tengstrom 2001), and hospitalized on an involuntary basis female psychiatric patients (Nicholls et al. 2004). Studies that assess criminal convictions after discharge in former inpatients with schizophrenia found 3.7–9 % of the total patients committed violent criminal acts during the follow-up period (Munkner et al. 2005; Soyka et al. 2007). Considering studies based on clinical sample, Estroff et al. (1994), in a sample of 169 patients with serious mental illness discharged from inpatient psychiatric hospitals in North Carolina, USA, reported that 23 patients (13.6 %) committed physical violent acts during a follow-up period of 18 months. Physically violence was mainly related to clinical variables: the diagnosis of schizophrenia and some specific interview subscales like confused thinking, false beliefs and perceptions and perceived hostility. No association was found with demographic or social network variables. The MacArthur Violence Risk Assessment Study found a rate of 27.5 % acts of violence in a 1-year follow-up in a sample of people discharged from acute psychiatric facilities at 3 sites in the US (Steadman et al. 1998). They reported the presence of a comorbid substance abuse disorder to be a key factor in violence. A preliminary study aimed at the construction of a brief checklist for assessing violence, showed that 29 (26 %) out of 110 patients had acted violently in the year after discharge (Hartvig et al. 2006). Previous violence, substance abuse, lack of empathy and stress correlated with later violence; in contrast, severity of illness did not predict violent behavior. Prevalence and predictors of violence are inconsistent in these studies, possibly due to methodological differences including different diagnosis and information sources on outcome (agency records, self reported instrument, key informants).

The present study analyzes physically aggressive behaviour over a 1-year follow-up in a sample of patients discharged from a psychiatric inpatient unit, including subjects with schizophrenia spectrum disorders, unipolar and bipolar mood disorders and personality disorders. We only examined patients who had shown some sort of aggressive behaviour (physical or not physical) in the month before hospitalization. Our study aimed to increase knowledge from earlier investigations by using a comprehensive set of possible predictors: sociodemographic data, clinical data (diagnosis, severity, comorbidity with substance abuse, course), detailed history of aggressive behaviour before and during hospitalization. The main objectives are:

(1) to evaluate prevalence and course of aggressive behaviours after discharge from an acute psychiatric inpatient unit;
(2) to identify predictors associated with physically aggressive behaviour in the short and long-term follow-ups.

Methods

The study consisted of 186 patients discharged from a locked short-term Psychiatric Inpatient Unit at the Bologna University Hospital. This Unit receives patients from outpatient Mental Health Services and from the Emergency Room of the General Hospital; the average hospitalization usually lasted about 15 days. All the included subjects had a history of aggressive behaviour in the month before admission land were part of a larger sample of patients consecutively admitted to the Unit in 1 year.

Baseline data collection was conducted at admission into the ward by research assistants with a specific training on use of the instruments and at least 3 years of clinical experience. In particular, we collected sociodemographic data on: civil status, living setting, work status or unemployment. We also gather information regarding psychiatric history (onset of the mental disorder, first contact with mental health services, first admission in psychiatric inpatient unit), past and present substance and alcohol abuse, and medical comorbidity. Psychiatric disorders were diagnosed using the Structured Clinical Interview for DSM-IV Axis I (Clinician Version) (First et al. 1997a) and Axis II disorders (First et al. 1997b). Moreover, the Brief Psychiatric Rating Scale (BPRS) (Overall and Gorham 1962) was administered to the patients.

Past aggressive behaviour was evaluated by interviewing patients, caregivers, other collateral informants, mental health professionals, and by examining clinical data, when available. Information gathered retrospectively was used to identify a profile of aggressive behaviour for any patient. Aggressive behaviours were divided depending on the time period—lifetime or recent (considering the month before admission)—and on severity, taking into account the

patients' highest level of hostile or violent behavior. In particular, severity of the behaviour was assessed by using the Overt Aggression Scale (OAS) approach (Yudofsky et al. 1986). The OAS is an easy to complete instrument that may be utilized in the routine clinical pratice. It showed good interrater reliability (greater than 0.75) for most items (Yudofsky et al. 1986).

The OAS is a standardized behavioural checklist that rates episodes of aggression in four main categories, representing escalating violent behaviour: verbal aggression, physical aggression against objects, physical aggression against self, and physical aggression against others). For the purpose of the present study we excluded physical aggression against self and used two categories: (1) verbal or against-object aggression (VOA) including be loud and demanding, make clear threats of violence toward others or aggression against objects; (2) Physical Aggression against others (PA) including grab another in a threatening way, strike, kick or push without injury, attack others causing physical injury.

Aggressive behaviours in the ward were assessed on the OAS by the nursing staff; the nurses were trained in the use of the scale and routinely filled out the checklist at the end of each 8-h shift. Quality control of this data was conducted by research personnel during the study period.

After discharge, two additional data collection contacts at 1 month and at 1 year were scheduled by the same research assistants conducting the baseline assessement. In particular, psychiatrists, nurses, social workers and other health care professionals working in the Bologna Community Mental Health Centres (CHMCs) that took in charge patients were contacted by the research staff to obtain information about aggressive behaviours in the whole year; interviews, based on OAS, were conducted face to face or, alternatively, by phone and were considered reliable only for patients that have regular contacts with staff (at least 1 contact per month). Patients with unreliable records and those lost to follow-up for any reason (for example: to move location, refusal to participate in study) were excluded from the analyses.

The study followed the ethical guidelines laid down by the Declaration of Helsinki (with amendments) (48th World Medical Assembly 1997) and was approved by the local Ethics Committee.

Statistical Analysis

Descriptive analyses were performed to illustrate the prevalence of the different aggressive behaviours in the present sample considering four time periods: the month before admission, the period of hospitalization, the first month after discharge, and the subsequent 11 months after discharge (reaching 1-year follow-up). Patients were divided into two groups according to the type of aggressive behaviour: verbal or against-object aggressiveness and physical aggressiveness.

To analyze factors associated with physical aggressiveness after discharge, we compared patients who perpetrated PA with patients who did not exhibit PA at 1-month and at 1-year follow-up assessments. In particular, one-way analysis of variance was used to compare means of continuous variables between two or more groups, while the Chi-square test was used to compare the frequency of categorical variables between groups. In all statistical analyses, an alpha level of 0.05 was established. Subsequently, logistic regression models were performed to find factors independently associated with PA in the follow-up. In detail, all the factors significantly associated with PA in the univariate analyses were entered in the models; some factors that resulted near to statistical significance were also included in the models. All the multivariate analyses were controlled by age and gender. Data were analyzed using SPSS for Windows, version 14.0.

Results

Three hundred forty seven patients were admitted in the short-term Psychiatric Inpatient Unit at the Bologna University Hospital in 1 year. Fifty four percent of the admissions (n = 186) were rated as having demonstrated aggressive behaviour in the month before admission. The majority of these latter patients were male (68.3 %) and lived with parents or relatives (47.5 %). The mean age was 40.6 ± 14.5 years. The most frequent diagnosis was "schizophrenia or other psychotic disorders" attributed to 52.1 %; personality disorders accounted for 28.5 % and affective disorders for 14.6 % (mainly bipolar disorders). Comorbidity with substance abuse was reported for 43.0 % of the sample. Considering the month before admission, 90 patients (48.4 %) rated as having engaged in physical aggressive (PA) behavior and 96 patients (51.6 %) engaged in verbal or against-object aggression (VOA). Almost half of the patients (47.8 %) reported physical assault in the previous history while 32.8 % reported other kinds of violence.

During hospitalization 72 out of 186 (38.7 %) patients committed PA. Of these 72, 17 showed PA at 1-month follow-up and 16 at 1-year follow-up contacts. Overall, only 6 patients out of 72 (8.3 %) resulted persistently PA in both of the two scheduled follow-up assessments.

Short-Term Follow-up

One-month follow-up information was collected from reliable sources for 156 patients (83.9 % of the initial

sample). Overall, 110 former patients (70.5 %) were reported as demonstrating VOA while 30 former patients (19.2 %) were rated as engaging in PA. Among the latter, only one patient display aggressive behaviour associated with severe physical injury. Unemployment was overrepresented in the PA patients in respect to not-PA patients (36.7 vs. 14.3 %; $\chi^2 = 8.020$, $df = 1$, $p = 0.005$). In addition, comorbid substance abuse (70.0 vs. 38.1 %; $\chi^2 = 9.999$, $df = 1$, $p = 0.002$) and a longer time from the first psychiatric admission (15.5 ± 11.3 vs. 10.5 ± 11.5 years; $F = 4.478$, $df = 1$, $p = 0.036$) were associated with PA. Finally, PA patients reported previous physical aggressive episode more frequently than not-PA patients both in the history (66.7 vs. 39.7 %; $\chi^2 = 7.132$, $df = 1$, $p = 0.008$) and in the month before admission (60.0 vs. 40.5 %; $\chi^2 = 3.744$, $df = 1$, $p = 0.053$). After multivariate analysis, substance abuse (aOR = 4.75; 95 % CI 1.77–12.72) and longer time from the first psychiatric admission (aOR = 1.05; 95 % CI 1.01–1.09) remained strongly correlated with PA in the month after discharge, while unemployment remained associated with PA to a small extent (aOR = 2.48; 95 % CI 0.89–6.88).

Long-Term Follow-up

One-year after discharge, data was collected for 145 patients (78.0 % of the initial sample). Overall, 101 former patients (69.7 %) were reported as demonstrating VOA while 28 former patients (19.3 %) were rated as engaging in PA. In two cases, PA was associated with severe physical injury. Compared to not-PA patients, those exhibited PA had a longer time from first contact with psychiatric services (17.1 ± 9.8 vs. 12.4 ± 10.7 years; $F = 4.512$, $df = 1$, $p = 0.035$) and reported more frequently PA during the hospitalization (57.1 vs. 35.8 %; $\chi^2 = 4.300$, $df = 1$, $p = 0.038$). In addition, 25.0 % of the PA patients compared with 9.1 % of the not-PA patients lived in residential facilities or supported living arrangements; differently, PA patients lived less frequently alone or with a spouse in respect to not-PA patients ($\chi^2 = 7.364$, $df = 3$, $p = 0.061$). Of the variables found to be significant or quasi significant in the univariate analyses, two remained so in the multivariate model: living in residential facilities or supported living arrangements (aOR = 6.20; 95 % CI 1.32–29.06) and PA during hospitalization (aOR = 3.54; 95 % CI 1.34–9.34).

Discussion

The risk of violence in mentally ill subjects is usually highest in the period before, during and immediately after hospitalization, when symptoms are most severe (Krakowski et al. 1999). Subsequently, it should tend to decrease due to therapeutic interventions initiated during hospitalization and continued after discharge. However, there are few follow-up studies that evaluate violent behaviour and, in particular, that focus on long-time assessments after hospitalization. Our study evaluated physically aggressive behaviour after discharge in a long period follow-up (1 year) in a sample of patients at moderately high risk of violence (history of recent aggressive behaviour). The main findings of the study are:

(1) About 20 % of discharged patients showed physical aggressiveness in subsequent follow-up contacts; however, only 6/186 patients showed persistent physically aggressive behaviour during hospitalization and in the two follow-ups.
(2) Risk factors for physically violent behaviour differ in the short-term and long-term follow-ups; different causes of violent behaviour could be hypothesized.

Our prevalence rate of PA in the follow-up (20 %) is intermediate compared to findings of similar studies in literature (Estroff et al. 1994; Steadman et al. 1998; Hartvig et al. 2006). However, it is difficult to compare findings across countries because of differences in healthcare organizations and in social conditions. Given that there are substantial differences between aggression prevalence rates in psychiatric wards in different countries (Nijman et al. 2005), we can also hypothesize that even in the post-discharge period many disparities exist. In Italy, few studies have examined the frequency and characteristics of violent behavior among psychiatric inpatients (Raja and Azzoni 2005; Grassi et al. 2006; Amore et al. 2008; Biancosino et al. 2009). Except our study, none of those collected data on the post-discharge period.

It is notable that very few patients continued to perpetrate physical assault both as inpatients and outpatients. When interpreting this data, it is necessary to consider that patients involved in the study were regularly visited in outpatient mental health services; thus, they were likely to receive some sort of pharmacological and/or psychosocial intervention and this may explain the low rate of severe episodes of violence.

Interestingly, predictors of physical violence are very different in the short and long-term follow-up assessments. In addition, predictors of physical violence in the follow-up seemed to be different with respect to those found in studies investigating ward aggressive behaviour: total BPRS scores at admission or some specific symptoms patterns (Krakowski et al. 1999; Amore et al. 2008). In our sample, in the short-term, the main predictive factors of aggressive behaviour were social problems such as substance abuse and, to a lesser extent, unemployment. Moreover, another important factor is a prolonged time from the first psychiatric admission, indicating a longer history of mental illness and possibly a more severe

disability. This data suggests that PA in the short-term period after hospitalization is related to social problems resulting in a difficult integration in the community.

Our study showed that physical violence in the long-term period was correlated to those living in residential facilities or in other supported living arrangements. These types of accommodations are necessary because the severity of mental illnesses and violence may reflect a high level of disturbance, as found by Soliman and Reza (2001) during prolonged hospitalizations. Aggressiveness could also be related to anger caused by difficulties in adapting to a residential service, as previously observed in a sample of patients suffering from psychotic disorders living in a therapeutic community (Fassino et al. 2009). Even the other risk factor found in the sample, physical aggressiveness during hospitalization, could be correlated to a more severe psychiatric illness. Subjects with severe mental diseases often present poor insight and lack of adherence to the pharmacological treatment and thus violent behaviours.

This study has three main limitations. The first limitation is the way in which the outcomes were assessed, based solely on evaluations by healthcare professionals (psychiatrists, nurses, social workers). It is possible that this methodology has reduced the rate of reported violent behaviours, that may be not have been observed by healthcare staff. Nevertheless, staff interviews may be reliable taking into consideration the fact that Italian Mental Health System usually provides continuative assistance to outpatients before and after hospitalization. In addition, we chose to include in the concept of PA all type of physical aggression ranging from aggression without consequences to severe physical injury; this approach is motivated by the very limited number of attacks with severe physical injury in the follow-up ($n = 3$). Thus, in our clinical sample, PA is generally mild to moderate and this is important for interpreting our results. A second limitation is the lack of information on the number of contacts with mental health services and on specific treatments (drug therapies, psychotherapies, other kinds of interventions) carried out after discharge; all the patients included in the follow-up received care in the CMHCs, but detailed information are not available. These data could have been useful as indirect measure of aberrant behaviors, possibly integrating and completing interviews with health personnel. Finally, we acknowledge that our sample could not be representative of all patients discharged from inpatient units. We collected only data on patients who showed aggressive behaviour in the month before admission and who were in charge of mental health services.

In conclusion, our study highlights only a small proportion of patients that show persistent physically violent behaviour. Thus, severe aggressiveness in psychiatric patients could be prevented by providing better care by developing an integrated therapeutic project, focused on the small proportion of patients at high risk of physical violence. Post-discharge PA seems to regard a limited number of psychiatric inpatients and is associated with specific risk factors. Different mechanisms appear to cause violence in the short and in the long-term period confirming that violent behaviour is a complex phenomenon with a multifactorial genesis involving several clinical and social risk factors.

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Conflict of interest None for any author.

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