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Sharon R. Foley · Stephen Browne · Mary Clarke · Anthony Kinsella · Conall Larkin · Eadbhard O'Callaghan

Is violence at presentation by patients with first-episode psychosis associated with duration of untreated psychosis?

■ **Abstract** *Introduction* Violence in first episode psychosis poses significant challenges for mental health staff and patients' families. Violence has been shown to be related to psychopathology. Duration of untreated psychosis (DUP) has been shown to influence psychopathology at presentation in first-episode psychosis, but little is known about the direct relationship between violence at presentation and DUP. We therefore sought to examine the relationship between these two variables. *Methods* Patients were all individuals aged between 16 and 65 years, with a DSM-III-R diagnosis of psychotic illness, taking part in a First Episode study. We used the Structured Clinical Interview (SCID-I), Positive and Negative Symptom Scale (PANSS), Beiser Scale and the Modified Overt Aggression Scale (MOAS) to evaluate diagnosis, psychopathology, DUP and violent behaviour respectively. Data for each case were retrospectively examined for violence, for the week prior to and week following first contact with psychiatric services, blind to diagnosis, DUP and psychopathology scores. *Results* We assessed 157 patients. About 46 patients (29%) were violent. Violence rates did not differ across diagnostic groups, while DUP varied significantly across diagnostic groups ($P = 0.001$). Violence was not associated with DUP across all psychoses ($P = 0.41$). In the schizophrenia subgroup ($n = 94$), thirty individuals (32%) were violent. In a logistic regression, logDUP was not associated with violence ($P = 0.11$). Violence was predicted by involuntary admission status ($P = 0.04$) and global positive symptoms ($P = 0.03$). DUP was associated weakly with negative symptoms ($P = 0.01$) but not associated with positive or general psychopathology. Neither pre nor post-contact violence was associated ($P = 0.79$ and $P = 0.09$ respectively) with DUP. *Discussion* Contrary to a recent study, we did not find an association between violence at presentation and DUP. The relationships between violence, DUP and psychopathology are complex and may be compounded by potential difficulties inherent in the PANSS. *Conclusion* Programs to reduce DUP may not impact on rates of violence at presentation in First Episode Psychosis (FEP).

■ **Key words** violence – schizophrenia – duration of untreated psychosis – psychopathology – PANSS

S.R. Foley (✉) · A. Kinsella · E. O'Callaghan
DETECT
1 Marine Terrace
Dun Laoghaire (Dublin), Ireland
Tel.: +353-1/2366-730
Fax: +353-1/2366-780
E-Mail: sharonrachelfoley@gmail.com

S. Browne
Dept. of Psychiatry
Waterford Regional Hospital
Waterford, Ireland

M. Clarke · C. Larkin · E. O'Callaghan
Dept. of Adult Psychiatry
Hospitaller Order of St John of God
Stillorgan (Dublin), Ireland

E. O'Callaghan
Dept. of Psychiatry
University College Dublin
Belfield (Dublin), Ireland

Introduction

Violent behaviour amongst individuals with psychosis poses significant challenges for mental health staff but more commonly, their own families [10]. Estimates of the incidence of violent behaviour in psychotic individuals vary because of heterogeneity of samples, study design and definitions of violent behaviour. One way to address this problem is to examine violent behaviour in a first-episode sample, so that confounding factors such as chronicity of symptoms and poor medication adherence can be controlled for. Estimates for incidence of violence in First Episode

Psychosis (FEP) have been shown to range from 29% (5) to 65% [14]. However, most studies indicate that physically violent behaviour in FEP is mostly of a minor nature, involving pushing, punching or kicking property, with injury to others the rarest type of violent behaviour. Estimates of violence causing injury to others in FEP range from 2.5% (5) to 14% [14]. Ultimately, violence of any kind has a negative impact on families, staff and other patients.

It is difficult to prevent violent behaviour without understanding the predictors. While our appreciation of the contribution of clinical correlates such as substance misuse [5, 10, 15], lack of insight and history of violence [2, 5] is improving, our ability to accurately predict violent behaviour remains poor.

Duration of Untreated Psychosis (DUP) is one clinical variable that has been the focus of much attention in recent years. DUP has been shown to influence presentation in FEP [11]. Melle et al. [9] have shown that a longer DUP is associated with higher general psychopathology scores at presentation. Higher levels of general psychopathology have also been linked to violence at presentation in FEP [2, 18], however it is unclear whether there is an independent relationship between violence and DUP. While several researchers [10, 14, 18], including ourselves [5], have reported on rates and correlates of violence in FEP, few have explicitly examined the relationship between violence and DUP. We sought to examine the relationship between these two variables in patients with first-episode psychosis.

Methodology

The sample comprised all individuals who participated in the first episode psychosis study based at Cluain Mhuire Family Centre and St. John of God Hospital, Dublin, Ireland. All individuals aged between 16 and 65 years, who presented from the catchment area and who met the DSM-III-R criteria for schizophrenia or other psychotic disorder were included. The study ran over 4 years (1995–1998) and the Cluain Mhuire community service had a catchment area of 165,000 people [4] during that period. St. John of God Hospital provided in-patient care for the catchment area. Ethical approval was received from the Provincial Ethics Committee of St. John of God Hospital. We used the Structured Clinical Interview (SCID) for DSM-III-R [1] for Axis 1 diagnoses [12] and the Beiser Scale for estimation of DUP [3]. We used the Positive and Negative Symptom Scale (PANSS) [6] to identify positive, negative and general psychopathology symptoms as well as insight. We collected relevant socio-demographic data at the time of admission. Data relating to alcohol and drug misuse was derived from the SCID interview. The Modified Overt Aggression Scale (MOAS) [7] was applied retrospectively to all case notes, nursing notes and incident reports by one researcher (SRF) for the week prior to and the week following first contact with mental health services. For those who were attending outpatients, the notes on their second outpatient visit were examined for evidence of violent behaviour in the week following first contact. The MOAS measures four subscales of violent/aggressive behaviour, including verbal aggression, aggression towards property, aggression against the self and aggression toward others. Each subscale was rated from zero (no aggression) to 4 (severe aggression). Violence was defined as per the Collins English Dictionary [17] as "the exercise of physical force". For the purpose of this study, we classified violence as a score greater than or equal to 1 for any of the three subscales of aggression towards property, towards self and towards others, with verbal aggression excluded. We chose this low threshold, as the majority of violent behaviour was of a minor nature, with over 50% of those demonstrating violence being in this category. An individual would rate as 1 on the aggression toward property scale if examples of their behaviour included slamming doors angrily, ripping clothing or deliberately urinating on the floor. An individual would rate as 1 on the aggression towards self scale if their behaviour included scratching skin, pulling hair out or hitting themselves. An individual would rate as 1 on the aggression towards others scale if their behaviour included making menacing gestures, swinging at people or grabbing at their clothing. We applied a binary score of 1 (violent) and 0 (non-violent) to each case.

We analysed data using SPSS [13]. We used Mann-Whitney and Chi Square tests to compare violence between groups. We used a binary logistic regression to identify possible predictors of violence. We converted the DUP variable into a log-transformed version (logDUP) because this variable was highly positively skewed. The binary logistic regression was constructed using the following independent variables, previously associated with violence in the literature: employment status, admission status, history of alcohol abuse, history of drug misuse, gender, logDUP, positive psychopathology score, general psychopathology score, negative psychopathology score and insight score [2, 10, 14, 18].

Results

We assessed 157 individuals (87 M, 70 F) with FEP. One individual had a DUP of 240 months and as this significantly deviated from the study group, we excluded this individual from our analyses. Violence was demonstrated by 46 individuals (29%): 35 individuals (22%) were violent toward themselves and/or property, 18 individuals (11%) were violent toward others not causing harm, three individuals (2%) caused minor injury to others and one individual (0.6%) caused serious injury to another. Violence rates did not differ across diagnostic categories (Chi-Square 3.16, $P = 0.21$). DUP varied significantly across diagnostic groups (Mean rank for Schizophrenia 77.5, Manic psychosis 39.5, Other psychoses 63.5, Chi-Square 14.5, $P = 0.001$). Violent and non-violent patients were indistinguishable in terms of DUP; for those who were violent, the mean DUP was 7.3 months (SD 13.0, median 2 months) while for those who were not violent, the mean DUP was 13.6 (SD 30.8, median 2 months), which is not statistically significant (Mann–Whitney Test, $z = -0.82$, $P = 0.41$). Because DUP was not associated with violence at the whole group level, we then assessed the relationship for individuals with schizophrenia or schizophreniform psychosis only.

Schizophrenia sub-group

We had complete data on 94 individuals (59 M, 35 F) in this group.

Baseline characteristics of the sample are found in Table 1.

Table 1 Baseline characteristics of schizophrenia sample (N = 94)

Variable	Number (%)
Male	59 (62%)
Female	37 (38%)
Mean age at presentation	27 years (SD 9)
Single	89 (93%)
Unemployed	56 (58%)
Voluntary admission status	75 (78%)
Involuntary admission status	21 (22%)
Inpatient	85 (89%)
History of alcohol abuse/dependence	18 (19%)
History of drug abuse/dependence	34 (35%)

Table 2 Predictors of violence: logistic regression model (n = 94)

Variables	Beta	Standard Error	Wald	Significance
Admission status	1.53	0.74	4.2	0.04
Gender	−0.65	0.59	1.2	0.52
Positive symptoms (PANSS)	0.10	0.05	4.7	0.03
Negative symptoms (PANSS)	−0.02	0.04	0.38	0.53
General psychopathology (PANSS)	−0.01	0.03	0.04	0.84
Insight	−0.32	0.67	0.23	0.63
Drug misuse	−0.44	0.55	0.66	0.42
Alcohol misuse	0.06	0.69	0.01	0.93
Employment status	−0.51	0.54	0.88	0.35
LogDUP	−0.84	0.53	2.51	0.41

■ Violence and DUP

In the schizophrenia sub-group, 30 (32%) individuals (21 M, 9 F) were violent. Of these, 12 individuals (12.7%) demonstrated violence against others without causing harm and two individuals (2.1%) were violent to others, causing harm (bruises, welts, bites). Thirteen individuals (13.8%) demonstrated violence toward property and thirteen individuals (13.8%) demonstrated violence toward themselves, seven of whom made suicide attempts. We carried out a binary logistic regression analysis using violence as the outcome measure. The following possible predictors were entered into the model: employment status, admission status, history of alcohol abuse, history of drug misuse, gender, logDUP, positive psychopathology score, general psychopathology score, negative psychopathology score and insight (Table 2). Involuntary admission status and higher positive psychopathology scores were associated with violence. DUP was not associated with violence in this model.

Replacing logDUP with a binary form of DUP (short: ≤6 months, long: >6 months) in the regression model produced similar results (involuntary status $P = 0.04$, positive psychopathology $P = 0.03$); binary DUP was not associated with violence ($P = 0.6$).

■ Timing of violence and DUP

Our assessment of violence spanned the week prior to and week following first contact with psychiatric services. To further examine the relationship between violence and DUP, we looked at pre-contact and post-contact violence and their relationship to DUP. Of the 30 individuals who were violent, 21 were violent in the week prior to service contact while 14 were violent the week following contact, and five individuals were violent in both periods. While 11 individuals (11.5%) with first episode schizophrenia or schizophreniform psychosis were treated as outpatients, all cases with pre or post-contact violence were treated as inpatients.

Using the same regression model as above, but using firstly pre-admission violence, then post-admission violence as the outcome measure, we found that DUP was not related to either (pre-admission violence $P = 0.8$ and post-admission violence $P = 0.09$)

■ Violence, DUP and psychopathology

Our regression model above showed that, of the psychopathology domains, only positive psychopathology scores were associated with violence. We then examined the relationship between DUP and positive, negative and general psychopathology scores and found that DUP was associated weakly with global negative symptom scores (Spearman's Rho 0.26, $P = 0.01$) but not associated with global positive symptoms (Spearman's Rho 0.09, $P = 0.38$) or general psychopathology (Spearman's Rho 0.02, $P = 0.82$).

Discussion

In our total sample of FEP, 29% of individuals demonstrated violence at first presentation. While DUP varied significantly across diagnostic groups, incidence of violence did not, confirming no relationship between violence and DUP at the whole-group level. We then focused on the schizophrenia and schizophreniform subgroup. Thirty two percent of the schizophrenia sample was violent at first presentation. Violence was predicted by involuntary admission status and positive psychopathology scores. DUP was associated weakly with negative symptoms, but not positive symptoms or general psychopathology.

Limitations of the study include the retrospective assessment of violence, which may have under-estimated the incidence of violence. In addition, we restricted our analysis to violence recorded as occurring during a 2-week period at presentation, and we did not analyse the frequency of such acts. While it would be ideal to examine violent behaviour over the course of the DUP for each case, the retrospective chart-review design of this study would have made this an unreliable method. A collateral interview would also have strengthened the study. A prospective study design is the optimum method for the study of

violent behaviour, but would be difficult for an FEP group, given they are generally not known to psychiatric services prior to first psychotic episode. The study of violent behaviour itself also poses challenges given the wide variation of behaviour from verbal threats to physical assault on property or people. While such behaviour can be monitored and recorded within the ward setting, it is not possible in the community for individuals with undiagnosed psychotic illness unless part of a longitudinal community cohort study.

We examined the 2-week period spanning first contact with psychiatric services, the midpoint of which represented the first contact with services as well as the date of hospital admission for 85% of the whole sample. We focused on this time period firstly because, for many, it represents a critical point of symptom/behaviour escalation which brings the patient to the attention of mental health services and secondly, the process of assessment and admission represents a significant challenge to the individual's coping skills. Cumulatively, these factors are likely to lead to an increase in risk of violent behaviour during this period.

Strengths of the study include the pre- and post-contact design, which allowed us to examine separately the relationship between violence and DUP for these periods. We postulated that using the MOAS for a short, defined period of time would increase validity; when information on violent behaviour was likely to be documented by the GP and family for the week prior to contact and with nursing and medical notes most likely documenting such behaviour on the ward the week following contact. Other strengths of this study include the first episode design and sampling from a geographically defined, ethnically homogenous catchment area population; this strengthens the representativeness of the sample. We included both inpatients and outpatients, which allows greater generalisability of the results. We used the MOAS, a well-validated and reliable scale [7], blind to diagnosis.

We did not have an a-priori hypothesis regarding the relationship between violence and DUP. Though one might expect that the length of time one has been psychotic for would increase the risk of violent behaviour, the length of that period could arguable be either long or short. A very short DUP is likely to represent an acute, florid psychosis, which may involve violent behaviour. Alternatively, a lengthy DUP is associated with increased and more resistant psychopathology, which may well contribute to violent behaviour.

We found that involuntary admission status was associated with violence. This is not surprising and could be regarded as a bi-directional relationship: violent behaviour on admission would increase the risk of involuntary detention while the process of involuntary detention itself could elicit violent behaviour. We found that violence was associated with positive symptoms, in agreement with Krakowski et al. [8] and Swanson et al. [16] while DUP was associated, though weakly, with negative symptoms, also shown in a meta-analysis by Perkins et al. [11].

We did not find a relationship between violence and DUP at first presentation. This is contrary to a recent report by Verma and colleagues [18], who found that longer DUP was associated with higher risk of violence in FEP. The difference in findings between the two studies may be explained by methodology, as Verma et al. assessed violence over an undefined period of time prior to first contact. The authors postulated that their finding may be attributed to a longer time period for violent behaviour to occur.

Though our study did not confirm it, both violence and longer DUP have been shown to be associated with increased general psychopathology [2, 9, 18]. However, as mentioned by Verma and colleagues [18], the Positive Psychopathology Scale of the PANSS measures hostility and the General Psychopathology Scale measures poor impulse control, lack of judgement/insight and tension; these are essentially aspects of violent behaviour and hence violent individuals will score high on these sections irrespective of mental state. The PANSS, therefore, is not the ideal tool for measuring psychopathology when examining violence. Our finding of an association between violence and positive symptoms thus may be flawed given the likelihood of high hostility scores in the Positive Scale section for those demonstrating violence. Further examination of the General Psychopathology Scale of the PANSS shows that this section consists of 16 items, some of which could be considered to be within the positive symptom range, such as unusual thought content (G9) and somatic concern (G1) while others are more akin to negative symptoms e.g. motor retardation (G7) and social avoidance (G16). Indeed, this could explain how both DUP, which is associated with negative symptoms, and violence, which is essentially scored on this section, have both been linked to general psychopathology, despite having no relationship to each other in this study.

Conclusion

Evidence is emerging for the potential benefits of reducing DUP through early intervention (EI) services [9]. We found no relationship between DUP and violence at the time of first presentation with psychosis indicating that programmes specifically focused on reducing DUP may have doubtful impact on rates of violence at presentation in this at-risk group. However, given the design of our study, we cannot comment on the possible effect reducing DUP may have on violent behaviour in the lead-up to presentation. This study also highlights the difficulty that arises when using the PANSS to examine psychopathology in relation to violence.

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