Demographics, Clinical Characteristics, and Treatment of Aggressive Patients Admitted to the Acute Behavioral Unit of a Community General Hospital: A Prospective Observational Study

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ABSTRACT

Objective: Aggressive patients are not uncommon in acute inpatient behavioral health units of general hospitals. Prior research identifies various predictors associated with aggressive inpatient behavior. This prospective observational study examines the demographic and clinical characteristics of aggressive inpatients and the routine medications these patients were receiving at discharge.

Method: Thirty-six adults diagnosed with a *DSM-IV* mental disorder who met 2 of 6 established inclusion criteria for high violence risk and a Clinical Global Impressions–Severity of Illness (CGI-S) scale score ≥ 4 were observed for a maximum of 28 days on the 23-bed case mix acute behavioral health unit of St Luke's University Hospital, Bethlehem, Pennsylvania, from January 2012 to May 2013. Primary outcome measures were the Modified Overt Aggression Scale (MOAS) and CGI-S; secondary measures were symptom outcome measures and demographic and clinical characteristics data. Analysis was conducted using repeated measures methodology.

Results: Younger males with a history of previous violence, psychiatric admissions, and symptoms of severe agitation were more at risk for aggressive behavior. Positive psychotic symptoms, a diagnosis of bipolar disorder, substance use, and comorbid personality disorders also increased risk. Significant improvements from baseline to last visit were observed for the CGI-S and MOAS ($P < .001$ for both), with a significant correlation between the MOAS and CGI-S at last visit ($P < .001$). Only the symptom of agitation was significantly correlated to MOAS scores at both baseline and last visit ($P < .001$).

Conclusion: Patients significantly improved over time in both severity of illness and level of aggression.

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Patients with aggression issues who present with characteristics and behaviors associated with a significant risk for physical violence are not uncommon in the acute inpatient behavioral health units of general hospitals.[1–13] The treatment of the aggressive patient challenges clinicians to safely, expediently, and effectively manage the needs of the aggressive patient as well as those of the unit's entire patient population. In this research, we delineate aggression from violence by defining violence as a physical act of aggression.

With the closing of state hospitals; insufficient housing for the mentally ill, intellectually disabled, and addicted individuals; the recurrent problem of community treatment unsuccessfully managing aggressive patients as evidenced by the frequent rehospitalization of these individuals; and controversy regarding if or when these patients' actions necessitate incarceration, the aggressive population is being admitted to the acute behavioral health units of general hospitals.[3,5,7,8,10,14–18] While unit staff may object to the admission of aggressive patients or hope the trend of treating these individuals will abate, studies have stated that these patients are merely a reflection of the aggression occurring in one's own culture and society, which therefore implies that the aggressive patient will continue to be a presence in the acute inpatient setting.[3,5,19]

Prior research regarding the aggressive patient population has focused on utilizing predictors that identify which patients are most likely to exhibit aggressive or violent behavior during hospitalization. These predictors are often grouped by categories such as demographics, clinical characteristics, contextual factors, and staff contributors and contain defined specifics within each category (Table 1).[1–5,7,9–16,18–32]

Studies have determined certain contributors and characteristics to be associated with inpatient aggression and increased risk (Table 2).[1–5,9,11,13–16,18,19,22–38] However, in addition to those patients identified as at increased risk for aggressive behavior, it is important to note that acts of aggression are most likely to occur within the first 1 to 2 weeks of hospitalization.[4,18,22,24,32]

Also, while many studies have reported that psychotic symptoms are significant contributors to aggression, some studies have remarked that it is not the psychotic symptoms themselves or even the patient's diagnosis that predicts aggressive behavior, but the severity of the symptoms being experienced that is the main contributor to aggression.[1–3,15,32,33]

Aggressive or escalating behavior and threats of physical violence are the most common reasons for administration of as-needed medications on behavioral health units.[39,40] The timely and accurate identification of the patient's need for medications and their efficient and safe administration are regarded as crucial to patient and staff safety.[19,40–42] However, whether the patient is receiving as-needed medication to subdue a temporary aggressive outburst or is receiving routine medication for the long-term stabilization of aggression, the research-recommended pharmacologic choice for either of these situations remains controversial and is supported only by weak data.[32,43]

Clinical Points

- Younger males with a history of previous psychiatric admissions and violence who presented with severe agitation symptoms were more at risk for aggressive behavior during hospitalization.
- Bipolar disorder, psychotic symptoms, and substance use significantly contributed to aggression.
- Patients significantly improved with inpatient treatment; aggressive patients most often experienced a significant reduction in symptoms of paranoia.
- Rehospitalization rates were high for patients with aggression issues, which suggest needed improvement in their outpatient treatment.

One study of borderline personality disorder showed statistical benefits against impulsivity and aggression through the utilization of antipsychotics.[44] Another study stated that clozapine had antiaggressive effects for treatment-resistant chronic schizophrenia and schizoaffective patients,[45] while an additional study reported that clozapine was effective for aggressive schizophrenia patients.[46] In a comparison study, clozapine was found to be more effective for violent schizophrenic and schizoaffective patients than olanzapine, which was found to be more effective than haloperidol,[47] yet another study reported that olanzapine and risperidone were superior to both haloperidol and clozapine for aggressive outpatient schizophrenics.[48] Intramuscular olanzapine was found to be more effective in a study for agitated schizophrenic patients than haloperidol or placebo.[49]

One study found that certain mood stabilizers reduce the frequency and severity of aggressive behavior: phenytoin, lithium, and carbamazepine/oxcarbazepine but not valproate or levetiracetam.[50] Conversely, several studies found antiaggressive properties for valproate.[43]

This study identifies the demographic and clinical characteristics of aggressive patients admitted to the acute inpatient behavioral health unit of a large community general hospital. This research also provides the medications these aggressive patients were treated with and continued on at the time of their discharge.

METHOD

The setting for this study was St Luke's University Hospital, Bethlehem, Pennsylvania, a 488-bed general hospital with a 23-bed acute inpatient behavioral health unit (NW7) serving an adult case mix population from local urban and suburban areas. This research was an prospective observational study with data gathered from January 2012 to May 2013. Pharmacologic treatment was provided as per the clinical judgment of the NW7 staff psychiatrists with medications and dosages prescribed at the clinicians' discretion. The study was approved by the St Luke's University Health Network Institutional Review Board; however, patient consent was not required due to the nonexperimental, naturalistic study design of an observational nature and the implementation of psychiatrists' "standard/as-usual" pharmacologic treatment.

Subject Selection

Data were obtained for each patient until the he or she was either discharged or his or her stay exceeded 28 days (extensive stays are usually due to homelessness). To participate, adult patients aged 18–80 years of any ethnicity had to satisfy inclusion/exclusion requirements, which included a *DSM-IV* mental disorder diagnosis obtained through NW7 staff psychiatrists' detailed psychiatric evaluation and admission intake.

Inclusion Criteria

Included patients met 2 of 6 established NW7 patient criteria for high violence risk:

1. Patient was in restraints and/or required intramuscular medication within 24 hours of NW7 admission.
2. Patient committed physical violence against objects, self, or others within 24 hours of NW7 admission.
3. Patient had threatening verbalizations against self or others within 24 hours of NW7 admission.
4. Patient arrived on NW7 unit severely agitated/threatening self or others.
5. Patient arrived on NW7 unit in restraints or required restraints within 24 hours of NW7 admission.
6. Patient arrived on NW7 unit requiring intramuscular medication or close one-to-one observation due to aggression.
7. Patient scored ≥4 on the Clinical Global Impressions–Severity of Illness Scale (CGI-S)[51] at NW7 admission.

Comorbid personality disorders or substance use disorders were permitted. Patients were permitted to receive psychotropic medication treatment orally or via intramuscular injections.

Exclusion Criteria

Exclusion criteria were as follows:

1. Diagnosis of Alzheimer's disease or dementia (aggression due to dementia and its treatment is a separate specialty of geriatric psychiatry).
2. A severe, unchanging medical condition considered to have a significant/primary relationship to the patient's mood state (severe head injury, end-stage disease processes) or a medical condition that conflicted with or prevented the course of pharmacologic treatment that would have been normally prescribed.
3. Patients who could not receive pharmacologic treatment intended for their psychiatric symptoms for various reasons: pregnancy, breast-feeding, legal issues.

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Table 1. Predictors Often Utilized in Identifying Patients Most Likely to Exhibit Aggressive or Violent Behavior During Hospitalization

Demographics	Clinical Characteristics	Staff Contributors	Contextual Factors
Age	Patient diagnosis	Staff communication style	Unit environment, includes physical environment as well as unit routine
Gender	Personality traits	Staff trained in aggression management from certified programs	Overcrowding
History of previous psychiatric admissions	Level of impulsivity	Staff experience in de-escalation management/threatening situations	Areas for privacy
History of prior violence	Level of hostility	No. of staff consistently present	Areas for nonstimulation
Involuntary or voluntary status	Specific symptoms prior to and at admission	Male staff presence	Patient case mix population on unit
Substance use	Severity of symptoms experienced prior to and at admission	Interpersonal relationship between engaged staff member and affected patient	Patient perception of staff
Employed or unemployed			Opportunities for activities/groups
Housing status			
Socioeconomic status			
Relationship status			
Support systems			
Education level			

Table 2. Predictors Often Associated With Aggressive Patient Behavior During Hospitalization

Demographics	Clinical Characteristics	Personality Traits	Staff Contributors
Male gender of a younger age	Psychotic symptoms	Hostility	Interpersonal exchanges with staff
History of psychiatric admissions	Conceptual disorganization	Suspiciousness	Patient feels restricted, controlled, or challenged by staff
History of prior violence	Hallucinations	Dominant personality type	
	Delusions of a persecutory nature	Uncooperativeness	
	Grandiosity	Prone to impulsivity	
	Suspiciousness	Lack of insight	
	Paranoia		
	Schizophrenia diagnosis		
	Bipolar disorder diagnosis		
	Substance use		
	Comorbid personality disorders		
	Organic brain disorders		
	Intellectual disabilities		
	Traumatic brain injuries		

4. Autistic patients or those patients with intellectual disabilities who possessed an extensive history of their main communication method being physically acting-out behavior (these aggressive behaviors are rarely altered during an acute inpatient stay other than mild improvements, which are most likely due to pharmacologic sedation).
5. A primary diagnosis of borderline personality disorder or any of the cluster B personality disorders; only very consistent behavior modification techniques (patient contracts, reward systems, dialectical behavior therapy, cognitive-behavioral therapy) are first-line therapy for these disorders and not pharmacotherapy.
6. Previously included participants who were discharged and then readmitted within the study time period were not included again.

Data

A sufficient number of patients were screened to provide a minimum of 30 patients enrolled. Demographic data were obtained at the patient's NW7 admission. Clinical characteristics (symptoms data: hallucinations, delusions, paranoia, anxiety, agitation, depression, and disorganization) were obtained at NW7 admission and then weekly and within 24 hours of discharge and were rated as not present, mild, moderate, or severe. The medications patients were discharged on were obtained within 24 hours of discharge. The Modified Overt Aggression Scale (MOAS)[52] was obtained at the patient's NW7 admission and then weekly and within 24 hours of discharge. The CGI-S was obtained at the patient's NW7 admission and within 24 hours of discharge.

Data Analysis

Because this is a preliminary analysis, there was no formal sample size calculation. Therefore, all statistical comparisons are for exploratory purposes only.

For the 2 primary outcomes (CGI-S and MOAS scores), 2 separate mixed randomized repeated-measures analysis-of-variance (ANOVA) models were constructed to assess the impact of age ($<$ or ≥ 35 years), gender, bipolar versus other diagnoses, and substance abuse status on the changes in CGI-S composite scores (model 1) and MOAS composite scores (model 2) from baseline to fourth visit. Because the visit 4 MOAS outcome was strongly skewed, this outcome was log transformed prior to analysis. The assumption of homogeneity of variance was met for all outcomes. For the sake of consistency and ease of interpretation, medians and interquartile ranges are reported for all models.

For the secondary outcome of symptom worksheet status from baseline to discharge (ie, hallucinations, delusions,

Table 3. Symptoms Rated as Severe at Baseline Among 36 Aggressive Inpatients

Symptom	N (%)
Agitation	24 (66.6)
Disorganized thinking	17 (47.2)
Delusions	14 (38.8)
Anxiety	13 (36.1)
Paranoia	9 (25.0)
Hallucinations	6 (16.6)
Depression	3 (8.3)

Table 4. Medications Patients Were Receiving at Discharge

Medication	N (%)
Haloperidol	10 (27.7)
Benztropine	10 (27.7)
Lorazepam	9 (25.0)
Lithium	9 (25.0)
Risperidone	8 (22.2)
Valproic acid	8 (22.2)
Aripiprazole	7 (19.4)
Lamotrigine	6 (16.6)
Olanzapine	5 (13.8)
Clonazepam	4 (11.1)
Paliperidone palmitate	4 (11.1)
Carbamazepine	4 (11.1)
Hydroxyzine	3 (8.3)
Quetiapine	3 (8.3)
Topirimate	3 (8.3)
Gabapentin	2 (5.5)
Oxcarbazepine	2 (5.5)
Chlorpromazine	1 (2.7)
Citalopram	1 (2.7)
Clonidine	1 (2.7)
Clozapine	1 (2.7)
Diphenhydramine	1 (2.7)
Diazepam	1 (2.7)
Ziprasidone	1 (2.7)
Mirtazapine	1 (2.7)
Phenobarbitol	1 (2.7)
Haloperidol decanoate	1 (2.7)
Sertraline	1 (2.7)

paranoia, anxiety, agitation, depression, disorganized thinking), separate McNemar tests were conducted. Symptoms were grouped into none and mild (first category) versus moderate and severe (secondary category). For all analyses, $P \leq .05$ denotes statistical significance, with no adjustment for the multiple comparisons.

RESULTS

A total of 36 inpatient participants had complete data for analysis. The mean age of participants was 37.03 years, with a standard deviation of 12.22 and an age range of 19–61 years. Whites represented 64% (n = 23/36) of participants, while 28% (n = 10/36) of participants were Hispanic and 8% (n = 3/36) were black. Excluded patients totaled 17 and consisted of 6 patients with a cluster B personality disorder as their primary diagnosis; 1 patient had a past severe traumatic brain injury, 8 patients were intellectually disabled, and 2 patients were autistic (the excluded patients with intellectual disabilities and autism had an extensive history of severely violent behavior). Of the excluded patients, 58.8% (n = 10/17) were readmitted within the study time period, while 30.5% (n = 11/36) of included participants were readmitted within the study time period. The average length of stay for participants was 12.7 days.

The majority of participants, 50.0% (n = 18), were diagnosed with bipolar disorder; 19.4% (n = 7) were diagnosed with schizophrenia, 16.7% (n = 6) were diagnosed with psychosis not otherwise specified, 11.1% (n = 4) were diagnosed as schizoaffective, and 2.7% (n = 1) had a diagnosis of major depression. Substance use was common in participants, as 69.4% (n = 25) reported abusing alcohol and/or illegal drugs, and 20.8% (n = 10) of participants had comorbid personality disorders. At admission, 83.3% (n = 30) of participants appeared psychotic, and 86.1% (n = 31) had a violence history. Also, 83.3% (n = 30) of participants had previous inpatient psychiatric admissions. Nearly 19.4% (n = 7) of participants were homeless, and the remainder were living with family, had their own living situation, or were in group home environments.

The participants' clinical symptoms obtained at baseline and rated as severe are listed in order of commonality: agitation, disorganized thinking, delusions, anxiety, paranoia, hallucinations, and depression (Table 3). We defined agitation as excessive purposeless restlessness and motor activity. The CGI-S baseline median score was 5.00, and the visit 4 mean score was 2.50. The MOAS baseline median score was 19.00, and the visit 4 mean score was 0.

The medications utilized most often in the participants' treatment and present at their discharge were haloperidol and benztropine, then lorazepam and lithium (Table 4).

Model 1: CGI-S

There was a significant within group effect across all 36 patients from baseline to fourth visit ($P < .001$), with a decrease in CGI-S scores over time for the sample as a whole. However, none of the group-by-time interactions were significant; specifically, CGI-S scores did not change significantly on the basis of age category < or ≥ 35 years ($P = .12$), gender ($P = .17$), bipolar versus other diagnoses ($P = 0 .58$), or substance abuse status ($P = .71$).

Model 2: MOAS

There was a significant within group effect across all 36 patients from baseline to fourth visit ($P < .001$), with a decrease in MOAS scores over time for the sample as a whole. However, none of the group-by-time interactions were significant; specifically, MOAS scores did not change significantly based on age category < or ≥ 35 years ($P = .83$), gender ($P = .60$), bipolar versus other diagnoses ($P = .72$), or substance abuse status ($P = .40$).

The correlation between the baseline CGI-S and MOAS scores was statistically significant at 0.40 ($P = .02$). The correlation between the visit 4 CGI-S and MOAS scores was statistically significant at 0.66 ($P < .001$). The symptom worksheet outcomes are as follows:

Hallucinations: the change from baseline to discharge was statistically significant ($P < .001$), with 88.2% (n = 15/17)

of participants going from moderate or severe to none or mild at discharge.

Delusions: the change from baseline to discharge was statistically significant ($P < .001$), with 84% (n = 21/25) of participants going from moderate or severe to none or mild at discharge.

Paranoia: the change from baseline to discharge was statistically significant ($P < .001$), with 96.3% (n = 26/27) of participants going from moderate or severe to none or mild at discharge.

Anxiety: the change from baseline to discharge was statistically significant ($P < .001$), with 85.3% (n = 28/34) going from moderate or severe to none or mild at discharge.

Agitation: the change from baseline to discharge was statistically significant ($P < .001$), with 85.3% (n = 29/34) going from moderate or severe to none or mild at discharge.

Depression: all patients remained at the none or mild level from baseline to discharge; no statistical calculations could be obtained.

Disorganized thinking: the change from baseline to discharge was statistically significant ($P < .001$), with 69% (n = 20/29) of patients going from moderate or severe to none or mild at discharge.

Additional correlational analyses based on the nonparametric Spearman's ρ were conducted regarding symptom severity and MOAS scores. With regard to baseline measurements, there was a weak positive correlation between paranoia and anxiety with MOAS scores and a moderate positive correlation between agitation and MOAS scores. At last visit, there were positive correlations between hallucinations, anxiety, agitation, and disorganized thinking and MOAS scores; delusions were trending toward significance but not significant at $P = .05$.

DISCUSSION

Our results agreed with prior research that cites younger males with a history of previous violence, past psychiatric admissions, and severe symptoms of agitation as being more at risk for aggressive behavior during acute psychiatric hospitalization.[1,3,9,11,13–15,18,22,23,25,26,32,33] Additionally, our results suggest that positive psychotic symptoms, a diagnosis of bipolar disorder, and substance use also contribute to aggressive behavior.

Only the symptom severity of agitation was significantly correlated to MOAS scores at baseline. However, the symptom severity of anxiety, agitation, disorganized thinking, and hallucinations was positively correlated to MOAS scores at last visit.

The participants' rating scores for severity of illness improved over time from baseline to last visit. Also, the participants' level of aggression decreased over time from baseline to last visit. But neither the CGI-S or MOAS scores changed significantly based on age, gender, diagnosis, or substance use; however, there was a significant correlation between the CGI-S and MOAS at baseline and one of more significance at visit 4, which may suggest a relationship between the participants' severity of illness and level of aggressiveness.

The results of the symptom worksheet demonstrated improvement through significant changes in severity from baseline to last visit. Study participants most often experienced a reduction in paranoia. These findings may stimulate questions regarding which symptoms appear to respond best or most readily to medications and inpatient treatment.

Patients with intellectual disabilities and those with a primary diagnosis of a cluster B personality disorder comprised the highest number of excluded patients. Although specific data were not captured, it was documented in routine unit charting that all of these patients did have aggressive and/or violent episodes during their inpatient stay.

The medications utilized for study participants may suggest efficacy due to significant improvements seen in both the CGI-S and MOAS over time from baseline to last visit; however, medication choices and their efficacy were not the focus of this study. Furthermore, the overall positive effects of the therapeutic inpatient unit environment must be taken into consideration as contributing to patient improvement.

Rehospitalization rates were high for both excluded and included patients, which may suggest that patients with aggression issues are difficult to treat and keep in compliance on an outpatient basis. The limitations of this study are the small sample size and its observational design.

Drug names: aripiprazole (Abilify), benztropine (Cogentin and others), carbamazepine (Carbatrol, Equetro, and others), citalopram (Celexa and others), clonazepam (Klonopin and others), clonidine (Catapres, Duraclon, and others), clozapine (Clozaril, FazaClo, and others), diazepam (Diastat, Valium, and others), diphenhydramine (Benadryl and others), gabapentin (Neurontin and others), haloperidol (Haldol and others), hydroxyzine (Vistaril and others), lamotrigine (Lamictal and others), levetiracetam (Keppra and others), lithium (Lithobid and others), lorazepam (Ativan and others), mirtazapine (Remeron and others), olanzapine (Zyprexa), oxcarbazepine (Trleptal and others), paliperidone (Invega), phenytoin (Dilantin, Phenytek, and others), quetiapine (Seroquel), risperidone (Risperdal and others), sertraline (Zoloft and others), valproic acid (Depakene, Stavzor, and others), ziprasidone (Geodon).

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