





Violence and Mental Illness

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A **BSTRACT:** Violence attracts attention in the news media, in the entertainment business, in world politics, and in countless other settings. Violence in the context of mental illness can be especially sensationalized, which only deepens the stigma that already permeates our patients' lives. Are violence and mental illness synonymous, connected, or just coincidental phenomena? This article reviews the literature available to address this fundamental question and to investigate other vital topics, including etiology, comorbidity, risk factor management, and treatment. A psychiatrist who is well versed in the recognition and management of violence can contribute to the appropriate management of dangerous behaviors and minimize risk to patients, their families, mental health workers, and the community as a whole.

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INTRODUCTION

In society today, mental illness and violence are often seen as inextricably linked, creating a harsh stigma for patients and, at times, an uncomfortable environment for psychiatrists. The perception carries serious consequences for psychiatric patients in the form of further discrimination and a sense of isolation from society. Violence has become of increasing concern in the practice of psychiatry. A large number of aggressive patients present to emergency departments,¹ and psychiatrists are often called on to assess and treat violent patients. Thousands of assaults occur in American hospitals each year, including psychiatric units and emergency rooms, resulting in the labeling of such workplaces by some as occupationally hazardous.² The literature suggests that psychiatrists have a 5- to 48-percent chance of experiencing a physical assault by a patient during their career,³ and that 40 to 50 percent of psychiatry residents will be physically attacked by a patient during their four-year training program.⁴ This type of patient implies specific challenges for the diagnosis and treatment of psychiatric disorders and their violent presentations, as the mental health provider is asked to identify potentially dangerous individuals and to intervene to reduce risk.

This article will help to clarify what, if any, link exists between mental illness and violence and to delineate the role of the mental health provider in addressing violent behavior.

VIOLENCE AND MENTAL ILLNESS: THE SCOPE OF THE PROBLEM

General population. Swanson, et al.,⁵ noted that 3.7 percent of the general US population perpetrates one or more violent acts each year, and the lifetime prevalence of aggressive behavior in the community may be as high as 24 percent. According to the Centers for Disease Control (CDC), 17,357 homicides occurred in 2004, making it the 15th leading cause of death and yielding a

death rate by violence for the year of 5.9 per 100,000.⁶ Among women and men under 45 years of age, those in the lowest socioeconomic class were three times more likely to be violent than those in the highest socioeconomic class. Rates of violence also increased with lower education level, less social stability, and in regions with high rates of unemployment.⁷

Mentally ill population. Most patients with stable mental illness do not present an increased risk of violence. Asnis, et al.,⁸ found that 21 of 517 outpatients (4%) in an urban setting reported a history of homicide attempts. Steadman and colleagues⁹ followed several cohorts of recently discharged American psychiatric patients for one year and compared rates of violence with violence rates in a community sample in the same neighborhood. The mean number of violent acts among the discharged psychiatric patients was 1.6 acts per discharged patient per 10-week period; at 50 weeks, the average number of acts per patient was 2.12. The rate of violence among psychiatric patients was higher than the community sample only during the first 10 weeks after discharge. Steadman and colleagues concluded that rates of violence among mental health patients peak at time of admission to the hospital, and they remain high for a period after discharge when many patients still experience active psychiatric symptoms.

Mental illness may increase the likelihood of committing violence in some individuals, but only a small part of the violence in society can be ascribed to mental health patients.¹⁰ Overall, those psychiatric patients who are violent have rates of repeated aggression somewhere between the general population and a criminal cohort.¹¹

Criminal population. Numerous studies have shown significant rates of mental illness in criminal populations. In 1998, 283,000 mentally ill persons were listed in the US penal system. In surveys, 16 percent of state prison inmates, 16

percent of local jail inmates, and seven percent of federal prisoners self-reported a previous mental health diagnosis or overnight stay in a psychiatric facility.¹² Teplin¹³ analyzed a random sample of 627 male arrestees and found the prevalence of mental illness to be almost three times that of the general population. Among the sample, the most common diagnoses were substance use disorders and personality disorders. Wallace¹⁴ found that 36 percent of convicted Australian killers had participated in psychiatric treatment at some point before their offense, most of which again was for personality disorders and substance abuse.

These studies often are not, however, able to reliably determine that the mental illness is a pre-existing factor that is directly responsible for the examined criminal behaviors. It is very likely, based on clinical experience, that mentally ill patients frequently encounter barriers to treatment, and that this inadequate treatment of their disorders results in patients being arrested for both violent and nonviolent crimes. Often such charges are based on behaviors that are direct manifestations of the patients' then untreated symptoms, such as paranoia leading to trespassing or grandiosity resulting in breaking and entering. The crimes examined here may or may not be violent in nature. Experience also suggests that victims of crimes by mentally ill individuals are often known to the patient, unlike non-psychiatrically ill criminals who may or may not violate strangers.

It is also unclear in this body of literature whether the crimes for which perpetrators are convicted involve illegal activities with drugs of abuse; crimes and diagnoses related to substance dependence exclusively may speak to a different issue than the link between violence and mental illness. On the other hand, in viewing comorbid substance dependence and mental illness as dually diagnosed disorders, drug-related crime may not require separate treatment. Substance dependence certainly

impairs judgment further and increases the likelihood of violent activity, as discussed later.

Further highlighting such issues, Hodgkins, et al.,¹⁵ cross-referenced data on convictions and psychiatric hospitalizations among 350,000 persons from Scandinavian countries born between 1944 and 1947 and found that those with a previous psychiatric hospitalization were more likely to be convicted of a crime. In a review of 13 studies published between 1965 and 1989, Link, et al.,¹⁶ found that mental health patients were three times as likely to be arrested as the general population. Steadman and Cocozza,¹⁷ in their review of violent behavior in criminally insane subjects, stated that virtually all violent offenses attributed to released psychiatric patients were committed by those who had criminal records preceding their hospitalization.

Studies have also examined the differences in psychiatric conditions between offenders who began committing crimes earlier versus later in life. Tengstrom¹⁸ demonstrated that individuals who commenced criminal activity earlier in life also had earlier psychiatric admissions. Early offenders were convicted of more offenses, committed crimes of a more violent nature, showed higher rates of recidivism, and were more likely to have a substance use disorder and evidence of psychopathy. These investigations again do not differentiate between stable and unstable mental illnesses, and they do not address causation.

ETIOLOGY OF VIOLENCE

Patients who are violent are not a homogenous group, and their violence reflects various biologic, psychodynamic, and social factors. Most researchers and clinicians agree that a combination of factors plays a role in violence and aggression, although there are differing opinions regarding the importance of individual factors.

Biologic factors. *Genetics.* A family history of violence constitutes a major discriminator between violent

and nonviolent individuals.¹⁹ Violence is likely a polygenetic phenomenon, with many genes acting in a coordinated fashion to produce an aggressive phenotype.²⁰ There is no evidence that there is a specific genetic locus, and it is unknown whether a family history of violence signifies genetic transmission or learned behavior. Nielson, et al.,²¹ found preliminary evidence that a disturbance in coding for tryptophan hydroxylase, the rate-limiting enzyme in serotonin synthesis, was found in patients with impulsive aggressive behavior. More recently, a polymorphism in the catechol O-methyltransferase gene on

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chromosome 22q has been associated with significantly higher levels of hostility in schizophrenic patients.²² Having a family history of antisocial personality disorder has been shown to increase the risk for development of conduct disorder, aggression, and antisocial behavior in children.²³ Eronen and colleagues²⁴ further noted that a family history positive for homicidal ideation and attempts was associated with extreme aggressive acts.

Twin studies have looked at the concordance rates for violence among twins as compared to the general population. Connor, et al.,²⁵ studied bullying behavior in younger middle class children and discovered a concordance rate for monozygotic twins of 0.72 and for dizygotic twins of 0.42, indicating that 60 percent of the variance in bullying behavior is due to genetic variation.

Cadoret and colleagues²⁶ examined children who had a biological family history of antisocial personality disorder who were adopted into either stable or pathologic homes. They determined the highest

incidence of aggression and conduct disorder occurred in children who had both the family history of antisocial behavior and were placed in disturbed adoptive homes, further confirming the suspicions among clinicians that violence has both genetic and environmental components.

Neurotransmitters. Researchers have focused on neurotransmitter involvement in a pathological model of aggression, directed by studies of suicidal patients and trials using different psychotropic medications in the treatment of violent patients. Investigators have determined that a low concentration of

5-hydroxyindoleacetic acid (5-HIAA), a metabolite of serotonin, in cerebrospinal fluid (CSF) is associated with an increased propensity for aggressive acts in psychiatric patients.²⁷ Brown and colleagues²⁸ also recognized this inverse correlation between 5-HIAA concentrations and a lifetime history of aggression, expressly in personality-disordered patients. Other studies repeated this finding in different populations, including impulsive murderers, arsonists, individuals who had committed infanticide, and suicidal patients. Stanley, et al.,²⁹ examined 64 nonsuicidal patients with various diagnoses and classified them based on a six-item history of adult aggressive behavior (aggressive, $n=35$; nonaggressive, $n=29$). The authors demonstrated that the aggressive group had significantly lower 5-HIAA concentrations in CSF than the nonaggressive group.²⁹

Laboratory-based experiments have shown that neurochemical interventions decreasing central serotonin functioning are linked with

an increase in aggressive behavior in animals.³⁰ Studies with mice that have the 5-HT_{1B} receptor gene knocked out demonstrate aggressive behavior compared to wild type mice.³¹ As human platelets and the human brain have identical serotonin transporters and receptors, platelet studies have

tomography (PET) imaging in violent individuals found deficits in either prefrontal or frontal functioning, suggesting problems in executive functions and interpreting environmental stimuli as threatening or safe.³⁴ These reports examined both patients with various diagnoses

the controls.³⁶ Other studies, focusing on personality-disordered patients, identified a significant decrease in glucose metabolism in the frontal cortex among those with aggressive tendencies.³³ Further evidence suggests that the limbic system is involved in the production of aggression. Specifically, stimulation of the amygdala in animals has resulted in rage attacks.³⁷

Psychophysiology. The association of physiologic markers and conditions such as aggression and antisocial personality disorder is an interesting area of study. Fourteen studies have examined the resting heart rate in young outpatients with antisocial personality disorder, and all found significantly lower resting heart rates in the antisocial cohorts, compared to controls.³⁸ Such findings are thought to propose a common under-arousal state among antisocial subjects. Investigators have found abnormalities on electroencephalography (EEG) in 25 to 50 percent of violent criminals studied.³⁹ Patrick and colleagues⁴⁰ conducted an examination of startle-blink measures, defined as muscle contraction around the eyes in response to a startling stimulus, in criminals with high versus low emotional detachment. They found that the high detachment group, which included antisocial individuals, displayed reduced startle-blink measurements, possibly representing decreased anxiety responses to stimuli.⁴⁰

Individual psychosocial factors.

Because a biologic-environmental interaction is likely responsible for violence and aggression, careful attention must be paid to psychosocial factors that contribute to the development of violent behaviors. Psychodynamic theory proposes that aggression is a reaction to the blocking of libidinal impulses. It further asserts that aggression can result from the projection of self-destructive impulses, or death instinct, onto external objects.³⁷ Impulsive aggression may be a direct response to the individual's perception of deprivation or

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shown that aggressive children with conduct disorder appear to have fewer 5-HT binding sites, suggestive of a reduced responsiveness of serotonin receptors in these children.³⁰

Depue and Spoont³² noted that mesolimbic dopamine pathways affecting responses to the environment have a role in promoting aggression. They suggest that increasing dopamine in these pathways enhances irritability and subsequent aggression.³² Subjects receiving drugs that increase norepinephrine activity in the central nervous system (CNS) showed increased aggression. Additionally, beta (β)-blockade in rats, decreasing norepinephrine availability, initially decreased fighting behaviors. As β receptors were up-regulated, fighting behaviors returned. Studies have also indicated that gamma-amino butyric acid (GABA) may have an inhibitory effect on aggressive behavior, although the evidence is inconclusive.³³

Neuroimaging. Advances in imaging of the brain have revealed preliminary data on regions and circuitry that may be involved in violence and aggression, both of impulsive and predatory types.³⁴ Prior to 2005, all 10 studies that investigated changes on single-photon emission computed tomography (SPECT) and positron emission

and healthy controls. It must be noted, however, that frontal hypometabolism has been associated with a range of psychiatric conditions, including schizophrenia, without specification for violent patients. PET scanning in 41 subjects indicted for homicide found significantly lower levels of glucose metabolism in the prefrontal cortex and corpus callosum, as compared to matched controls, also suggesting that the ventral prefrontal cortex plays an important role in the control of impulsive urges, including aggression.³⁵ Other imaging studies focusing on the temporal lobe reported dysfunction in temporal lobe activity, particularly in subcortical structures such as the amygdala, hippocampus, and basal ganglia.³⁴ These regions are involved in fear and danger responsiveness, and they are dense in serotonin receptors, indicating that dysfunction in these regions may disrupt serotonin activity.³⁴

Narayan and colleagues studied 56 total subjects, including patients diagnosed with antisocial personality disorder or schizophrenia as well as a control group. With structural magnetic resonance imaging, they demonstrated that violent behavior was associated with thinning in various areas of the cortex, which differed in the schizophrenic and antisocial patients, as compared to

punishment, and is often coupled with feelings of frustration, fear, injustice, and anger.³³ Beck⁴¹ asserts that aggressive individuals develop a cognitive framework containing basic flaws in perceptions of social interactions, so that the individual sees others as responsible for all of his or her problems.

Social learning theory offers that violent behavior is a product of past experiences, which involved predisposing environmental conditions and reinforcing rewards. Pervasiveness of violent images in the media may desensitize viewers to violence.³⁷ Swanson and colleagues⁴² identified multiple factors in the environment that were significantly associated with violence, including homeless and witnessing or experiencing violence.

That same desensitization and the importance of past experiences are displayed in a number of studies finding that a family history of violence is predictive of violent behavior.⁴³ Green and Kowalick²⁰ noted that variables such as parental hostility, maternal permissiveness, and absence of maternal affection could predict subsequent antisocial behaviors. Other psychosocial factors may include abuse as a child, poor parental modeling, limited social supports, and poor school experiences.⁴ Conversely, increased family contact, especially if fraught with conflict, can prompt aggression and violent acts. Elbogen and colleagues assessed 245 severely mentally ill patients discharged on an outpatient commitment for one year and discovered that high family contact and family representative payeeship increased the predictive probability of family violence, after controlling for covariates such as violence history and substance abuse.⁴⁴

In examining violent youth, Steinburg and colleagues⁴⁵ suggest that, through violence, adolescents may be able to obtain financial reward, feel powerful, and protect themselves in threatening environments. Other contributing factors specific to hate crimes in

youth include frustration, boredom, and erroneous learned ideas that certain victims are appropriate targets for violence. Another study examined physically assaultive adult inpatients ($n=238$) diagnosed with major mental illnesses and discovered a higher prevalence of school truancy and foster home placement in the violent group, compared to a nonviolent control group.⁴⁶

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DIAGNOSES ASSOCIATED WITH VIOLENCE

Substance use disorders.

Substance use disorders have been proven to vastly increase the risk of a violent incident. Holcomb and Ahr⁴⁷ found that patients with alcohol or drug use had more arrests over their lifetime than patients with schizophrenia, personality disorders, or affective disorders. Eronen, et al.,²⁴ discovered that the combination of alcoholism and antisocial personality disorder increased the odds of women committing homicide 40 to 50 fold, while the diagnosis of schizophrenia increased the risk only 5 to 6 fold. Steadman and colleagues⁹ determined that patients with concomitant mental illness and substance abuse were 73 percent more likely to be aggressive than were nonsubstance abusers, with or without mental illness. Further, patients with primary diagnoses of substance use disorders and personality disorders were 240 percent more likely to commit violent acts than mentally ill patients without substance abuse issues.⁹

Intoxication or withdrawal from various substances of abuse, including alcohol, sedatives, cocaine, amphetamines, and opiates, can promote violent behaviors, with or without comorbid mental illness (Table 1).⁴⁸ In a study of 59 psychiatric inpatients, Blomhoff, et al.,⁴³ determined that abuse of nonalcoholic psychoactive substances

was one of only three significant demographic and clinical variables differentiating the violent group from the nonviolent group. Swanson and colleagues⁵ noted that substance abuse was by far the most prevalent diagnosis among survey responders reporting past violent acts. Substance abuse was present in 42 percent of violent responders and in only five percent of nonviolent responders. In

addition, female substance abusers were equally as violent as male substance abusers. In this study, substance abusers also demonstrated a greater propensity to assault more than one victim and to use a weapon during a violent incident. Of those who acknowledged alcoholism, 25 percent reported a history of violence.⁵ Over and above these acute factors, chronic alcoholism is more predictive of violence than is immediate alcohol use.⁴

Substance abuse also plays a significant role in domestic violence. In their synopsis of this topic, Rudolph and Hughes⁴⁹ denoted that the strongest single predictor of injury to a victim of domestic assault is a history of alcohol abuse in the perpetrator. In addition, up to 45 percent of female alcoholics and 50 percent of female drug abusers have been battered. The most predictive factor for elder abuse was also found to be alcohol abuse in the caregiver.⁴⁹

Other psychiatric disorders.

Psychiatric disorders associated with violence are wide-ranging, and can include psychotic disorders, affective disorders, Cluster B personality disorders, conduct and oppositional defiant disorders, delirium and dementia, dissociative and posttraumatic stress disorders, intermittent explosive disorder, sexual sadism, and premenstrual dysphoric disorder.⁴ Steadman's prospective study⁹ on recently

TABLE 1. Substances of abuse that promote violence

| SUBSTANCE | VIOLENCE IN INTOXICATION | VIOLENCE IN WITHDRAWAL | TOXICOLOGY SCREENS | COMMENTS |
|-------------------|--------------------------|------------------------|---|--|
| Nicotine | --- | --- | Urine cotinine, breath tests | Concern on inpatient units: Irritability caused by withdrawal can lead to agitation and violence |
| Alcohol | ++ | ++ | Serum BAL | Disinhibition, delirium, black-outs, irritability |
| Cannabis | + | --- | UDS up to 30 days | Paranoia, depersonalization, derealization |
| Cocaine | ++ | --- | UDS 48–72 hours | Agitation, hypersexuality, impulsivity, psychosis, mania |
| Heroin/opiates | --- | + | UDS 1–3 days | Irritability |
| Amphetamines | ++ | --- | UDS 48–72 hours | Agitation, irritability, impulsivity, hypersexuality |
| Hallucinogens | + | --- | Little reliability in lab testing, rely on clinical suspicion | Anxiety, hallucinations |
| PCP | +++ | --- | UDS 7–14 days | Belligerence, impulsivity, unpredictability, decreased responsiveness to pain, bizarre behavior |
| Sedatives | + | ++ | Variable by specific compound in lab testing | Paradoxical reactions, delirium |
| Inhalants | ++ | --- | Variable in serum testing | Belligerence, impulsivity, apathy |
| Ecstasy (MDMA) | + | --- | Variable in serum testing | Impulsivity, hypersexuality, agitation |
| Anabolic Steroids | +++ | --- | Variable in serum testing | Anger (“roid rage”), hostility |

BAL=blood alcohol level; MDMA=methylenedioxymethamphetamine; UDS=urine drug screen; + indicates mild risk for violence; ++ indicates moderate risk for violence; +++ indicates high risk for violence; --- indicates likely noncontributory to violence risk

discharged patients indicated that the one-year prevalence rates for violent incidents was 18 percent for major mental illness without co-occurring substance abuse, 31 percent for major mental illness with comorbid substance abuse, and 43 percent for personality-disordered patients with comorbid substance abuse. The rate for mentally ill patients who didn't abuse substances was roughly equal to that of patients who are not

mentally ill and who did not abuse substance.⁹

In a long-term study of schizophrenic patients, substance abuse increased conviction rates for violent crimes 16-fold among the schizophrenic group, and 30 percent of male subjects with both schizophrenia and substance abuse had been convicted of a violent crime.⁵⁰ Swanson, et al.,⁵ found that the rate of violence among those with

a mental illness was twice that of those without a mental illness, but violence was not more prevalent in persons with schizophrenia than among those with other disorders. The study noted that 92 percent of schizophrenic patients were not violent by their own report. Swanson points out that the rate of violence increased linearly with the number of diagnoses, and they concluded that major mental illness was one risk

factor for violence, among many others.⁵

Approximately 20 percent of violent psychotic patients are motivated directly by their delusions or hallucinations.⁵¹ Compliance with command hallucinations increased if that hallucination involved of a familiar voice and was associated with a delusion.⁵² Patients who experience persecutory delusions may attack preemptively, believing that they are protecting themselves. Mentally ill patients with threatening, paranoid delusions are twice as likely to become aggressive compared with nonparanoid psychotic patients.¹² Link, et al.,¹⁶ hypothesized that the differences among comorbidity studies may reflect patients who were identified as carrying a psychotic diagnosis, but who were not actively experiencing symptoms at the time of the measurements. The authors also proposed that specific types of paranoid delusions made a violent response more likely. Their concept of “threat/control-override” delusions includes patient beliefs that people are seeking to harm them and that outside forces are in control of their minds. The authors showed that increases in the number and intensity of such delusions were associated with increases in violent behavior.⁵³ Other studies, however, have found this to be less significant when controlling for factors such as substance abuse and nonadherence with treatment.⁵⁴

Studies suggest that up to 30 percent of outpatients with Alzheimer’s disease exhibit violent behavior.⁵⁵ Manic and demented patients are the most likely types of patients to commit violent acts or display aggression on an inpatient unit. Their victims are usually random bystanders rather than predetermined targets. Patients with mental retardation often use violence to respond to or communicate about psychosocial stressors, as their deficits preclude them from developing more adaptive, nonviolent ways of responding.¹² Fava and colleagues⁵⁶ revealed that 55 of 126 (44%) depressed patients reported

anger attacks as part of their symptoms; irritability associated with depression and anxiety could culminate in aggression.⁵⁶ Cases of depression that exhibited anger attacks had significantly higher rates of comorbid dependent, avoidant, narcissistic, borderline, and antisocial personality traits than patients with depression without such attacks.⁵⁷

Medical conditions. Certain medical conditions are associated with violent behavior and should be excluded first as sources of the presenting aggression. As many as 70 percent of patients with brain injury secondary to blunt trauma exhibit irritability and aggression.⁵⁸ Intracranial pathology, such as trauma, infections, neoplasms or malformations, cerebrovascular accidents, and varieties of degenerative diseases can manifest as delirious, affective, or psychotic syndromes involving violent behaviors. Metabolic conditions, such as thyroid storm, Cushing’s disease, or androgen or estrogen dysregulation have been associated with aggression. Systemic infections, environmental toxins, and aberrant effects of medications can result in violence.⁴ Complex partial seizures in particular can result in aggressive symptomatology, and studies have shown that anticonvulsants treat aggression in patients with temporal lobe foci on abnormal EEGs.⁵⁹

Once safety has been assured, the emergency evaluation of a violent patient should include a complete history and physical examination to search for a medical cause of the behavior. Screening laboratory studies are also essential in effectively assessing and treating aggressive individuals (Table 2). Violent patients should have their serum glucose level checked upon presentation, as aggression, confusion, and irritability can be a manifestation of hyper- or hypoglycemia. Other initial laboratory testing should include complete blood counts, comprehensive metabolic panels, calcium levels, creatinine phosphokinase, toxicology screen and blood alcohol level, and a brain CT or MRI. Other testing, such as chest

TABLE 2. Laboratory testing in the work-up of the violent patient

| |
|--|
| Complete blood count |
| Electrolytes |
| Renal function |
| Liver function |
| Calcium level |
| Creatinine phosphokinase |
| Toxicology screen |
| Blood alcohol level |
| CT or MRI of brain |
| OPTIONAL TESTS: Chest radiograph Medication levels Thyroid function tests Lipoprotein levels B12 levels Arterial blood gases |

radiograph, thyroid function, B12 and medication levels, lipoprotein levels, and arterial blood gases, should be employed as clinically indicated.⁴

RISK FACTORS FOR VIOLENCE

Static risk factors. Much of the literature on violence in psychiatric practice has been devoted to determining static and dynamic risk factors. Static risk factors are patient characteristics of the patient that cannot be changed with clinical intervention, such as demographics, diagnoses, personality characteristics, and prior history. Even though risk factors represent associations with outcomes, they do not imply overt causation.⁶⁰

The most replicated and affirmed static variable associated with the prediction of future violence is a history of past violence.^{4,12,43,61,62} The risk of future violence increases linearly with the number of past violent acts.¹² Persons who have acted aggressively because of their delusions in the past are likely to do so in the future.⁵⁴ Janofsky⁶³ found that violent behavior before admission to the hospital is correlated with violence as an inpatient in a psychiatric facility. A history of impulsivity is also related to future violence, as Asnis and colleagues⁸ showed that 91 percent of patients who attempted homicide also had attempted suicide during their lifetimes.

Other static risk factors include male sex, younger adult age, lower intelligence, history of head trauma or neurological impairment, dissociative states, history of military service, weapons training, and diagnoses of major mental illnesses.¹² In a review of literature, Bonta, et al., found that younger age, male sex, single marital status, and having antisocial peers were associated with violent recidivism. Most evidence shows that race and social class are unrelated to recurrence of violence.¹¹ Poor work adjustment can be an additional static risk factor in a patient's social history; other static variables include a dysfunctional family of origin and a history of abuse as a child.¹²

Using the National Comorbidity Study data collected from 1990 to 1992, Corrigan and colleagues demonstrated that participants who reported more than three psychiatric diagnoses were 2 to 4.5 times more likely to also report violent behaviors, as opposed to participants who reported only one diagnosis.⁶⁴ Major mental illnesses are a static risk factor, but active symptoms or the presence of a relapse may be more exact predictors of violence risk, and are considered dynamic variables that are likely amenable to treatment.¹⁰ Thus, the association between mental illness and violence is best viewed in a longitudinal perspective, with increased risk at different points

throughout a patient's lifetime. Compared to other sociodemographic and historical factors, the contribution of mental illness to the overall risk of violence in society as a whole is relatively small.⁶⁰ In fact, demographic variables, particularly gender, are far better predictors of violence than psychiatric diagnoses of either substance abuse or nonsubstance abuse disorders; thus, stress on the connection between violence and psychiatric illness may be unnecessarily propagating stigma about mental illness.⁶⁴

Dynamic risk factors. Dynamic risk factors are variables in a patient's presentation that can potentially be improved with clinical intervention.⁶⁵ They are often closely related to or even the same as those clinical symptoms that bring patients to acute care settings.⁶⁰ Perhaps the most frequently cited dynamic risk factor is substance abuse or dependence.¹⁰ Other dynamic risk factors include persecutory delusions, command hallucinations, nonadherence with treatment, impulsivity, low Global Assessment of Functioning (GAF) score, homicidality, depression, hopelessness, suicidality, feasibility of homicidal plan, access to weapons, and recent move of a weapon out of storage.¹²

Untreated psychotic symptoms represent significant risk factors for violent behavior, especially psychotic symptoms that threaten the patient, or that involve losing control to outside forces.⁸ Among inpatients with schizophrenia, the most predictive variables for violence are suspiciousness and hostility, more severe hallucinations, poor insight into delusions and the overall illness, and greater disorganization of thought processes.¹² Delusions alone are not associated with violence except when delusions are persecutory in nature or involve conscious thoughts of committing violence.⁵⁴

Recent estimates suggest that up to 80 percent of patients are nonadherent to treatment recommendations at some point during their illnesses.⁶² Nonadherence may be associated with violence and

can be addressed through psychoeducation, cognitive-behavioral and supportive therapy, outpatient commitment, and intensive case management, as well as through focus on the therapeutic alliance. Bonta, et al., note that poor living situation and limited social support are risk factors for violence, but these can be altered by placing the patient in a supervised setting, providing family therapy, and involving the patient in positive community activities.¹¹

CASE EXAMPLE

JB was a 45-year-old married man who was involuntarily committed to the state hospital for severe depression, worsening over the previous several months, with multiple suicide attempts. The patient's most recent suicide attempt involved jumping off the roof of his two-story home. In addition to severe neurovegetative symptoms, the patient exhibited some psychotic features, including delusions that his wife and children were destitute and starving. During the transfer to the state facility, the patient became aggressive and attacked the police officer escorting him in an attempt to obtain the officer's gun and commit suicide.

The patient arrived on multiple medications from his stay at the community hospital, including a nortriptyline 50mg at bedtime, citalopram 20mg daily, benztropine 2mg twice daily, lorazepam 1mg twice daily, zolpidem 10mg at bedtime, and quetiapine 200mg at bedtime. In addition to a 25-year history of depression, the patient's medical history was significant for mild hypertension and acid reflux. A computed tomography (CT) scan of his brain several months before this admission revealed mild cortical atrophy in the frontal regions.

There was no evidence from collateral sources that the patient engaged in any current or past substance abuse: His last drink was two months prior to this admission. The patient did endorse a significant family history of depression, which included his mother receiving

electroconvulsive therapy in the remote past and two cousins committing suicide.

After two days on the acute unit in the state facility, while continued on most of his medications, JB began to exhibit aggressive behavior; he approached other male patients and pinched or punched them without provocation. When questioned by staff about these incidents, the patient stated, "People are out to get me." He indicated that he intended to take preemptive action against those that he believed were targeting him on the unit. He was alert and oriented in all spheres during and immediately following these episodes. He did, however, repeat questions about irrelevant topics while being restrained for attacking other patients and staff.

The violent incidents continued at various times throughout the day, and multiple emergency medications were tried without much effect. The patient appeared very anxious, and he was only responsive to staff reassurance and redirection for several minutes before becoming aggressive again. A thorough review of his medication regimen uncovered multiple agents with possible deleterious effects on his cognition. Unnecessary medications, such as anticholinergics, benzodiazepines, sleep aids, sedating antidepressants, and antipsychotics were stopped or tapered off. The patient unfortunately ended up in restraints after several of these attacks, as he did not respond to redirection or doses of calming medications.

SAFETY AND ENVIRONMENTAL INTERVENTIONS

Modifying a patient's environment to prevent or decrease aggression is mainly of concern to inpatient facilities, although similar adjustments in a person's home situation by outpatient clinicians may also have benefits. Studies have shown that most violent incidents occur earlier in the mornings and evenings, particularly when patients are gathered together in small areas. A study of 118 psychiatric inpatients

Table 3. Environmental modifications to help control aggression

| EMPLOY: | |
|--|--|
| Calm, soothing tone of voice | |
| Positive and friendly attitude of helpfulness | |
| Expressing concern for patient's wellbeing | |
| Offering of food or drink | |
| Allowing phone calls to trusted support person | |
| Decreasing waiting times | |
| Distraction with a more positive activity | |
| Removal of potentially dangerous items from area | |
| Verbal redirection and limit-setting | |
| Relaxation techniques | |
| Close observation or one-to-one sitter | |
| Quiet time or open seclusion | |
| AVOID: | |
| Overcrowding patients | |
| Unpleasant or polluted surroundings | |
| Loud and irritating noises | |
| Intimidating direct eye contact | |
| Unnecessary invasion of personal space | |
| Direct confrontative stance with crossed arms | |
| Hands concealed in pockets | |

Adapted from: Buckley P et al. Treatment of the psychotic patient who is violent. *Psych Clin N Am* 2003;26:231-272.

with psychotic and/or substance use disorders admitted within two weeks to an urban hospital showed that patients who were involuntarily hospitalized exhibited more aggression. The authors also demonstrated that patients with an uncomplicated substance use disorder trended toward more total aggression than psychotic patients and patients with comorbid psychosis and substance abuse.⁶⁶ Warning signs that may precede violence include pacing, psychomotor agitation, combative posturing, guardedness, paranoid or threatening remarks, low frustration tolerance, emotional lability, and irritability. Environmental control can aid in containing violence, and it is essential to catch the patient in these earlier stages leading up to aggression and provide some measure of control to de-escalate building violence (Table 3).¹²

Having sufficient numbers of staff present as well as avoiding overcrowding of patients decreases violent acts. Staff members should be well trained to pick up cues that signal mounting aggression. They must be able to maintain calm, comforting demeanors and refrain from using direct confrontation and intruding on a patient's personal space. Beneficial techniques include verbal redirection, implementation of relaxation techniques, close observation, distraction of the patient's attention away from triggers of aggression, and the use of quiet time or open seclusion in areas of the unit with decreased stimuli. Unpleasant surroundings and loud, irritating noises also increase the likelihood of violence.¹² The longer aggressive patterns of behavior have been in place, the less likely it is that they will be modified by changes in the environment alone.²⁰

Seemingly simple interventions can have a tremendous impact on violent outcomes. These include offering something to drink or eat, decreasing wait times, maintaining a positive and friendly attitude toward the patient, avoiding intimidating direct eye contact, and removing potentially dangerous objects from the area. Since a staff member's body language can contribute significantly to triggering violence, uncrossing arms and displaying empty hands can be less threatening. Remaining empathetic, making soothing statements, and expressing concern for the patient's wellbeing reinforces the idea that everyone is present to ensure the patient's safety and access to treatment. Positive reinforcement for peaceful choices in behavior and for behavior that preserves the treatment community's order and boundaries can be useful. Consistency in setting limits on behavior and suggesting alternatives to violence, such as talking to staff or making a

Seemingly simple interventions can have a tremendous impact on violent outcomes. These include offering [the violent patient] something to drink or eat, decreasing wait times, maintaining a positive and friendly attitude toward the patient, avoiding intimidating direct eye contact, and removing potentially dangerous objects from the area.

phone call, are important de-escalation techniques.¹²

The governing principle of managing violent psychiatric patients is the doctrine of least restrictive alternatives. This necessitates managing aggressive patients with the least restrictive yet effective means possible. Restraints or locked seclusion are the final resort in dealing with imminent danger in an emergency or inpatient setting. In implementing restraints, the staff should identify a team leader and complete the procedure in a standard and calm manner.¹² Each inpatient psychiatric facility maintains policies and guidelines for the application of restraints and seclusion to which staff must adhere.

PSYCHOTHERAPY INTERVENTIONS

Patients with more frequent visits to their mental health centers have a reduced likelihood of threatening violence or committing violent acts against family members.⁶⁷ The psychotherapeutic relationship can be healing and restorative in and of itself, but specific techniques certainly contribute the curative element of the treatment. Alpert and Spillman⁶⁸ completed a review on psychotherapeutic treatments for violent patients, emphasizing that all therapists need to maintain a safe therapeutic environment for themselves and the patient, complete sufficient training on the management of violent patients, and have access to consultation and supervision.⁶⁸

Countertransference is an intriguing consideration in the treatment of aggressive patients. The therapist's countertransference reactions may influence the progress of treatment, including under- or overestimating risk and becoming

overinvolved with or neglectful of the patient. In trying to build a therapeutic alliance with a violent patient, the therapist may ignore feelings of fear or disgust, which could have disastrous consequences. Alternately, the clinician may find it difficult to relate and empathize with an aggressive patient, especially if such acts are chronic. Without self-monitoring, the therapist may find it difficult to maintain a supportive, nonjudgmental stance and avoid inappropriate reactions.⁶⁸

Various modalities of therapy could apply to the violent patient. Therapists with a behavioral focus would be more concerned with prior triggers, violent behaviors, and consequences for actions. Many

institutions employ these behavioral techniques in the form of levels of privileges that the patient can earn. Social skills training promotes more acceptable assertive behaviors and reinforces self-control mechanisms. Cognitive approaches focus on incorrect automatic thoughts that precede anger reactions in the context of larger faulty belief systems that direct an individual's perceptions of external events. Filtering experiences through these inaccurate cognitive schema results in distortions of situations, with subsequent unnecessary feelings of anger and inappropriate responsive behaviors.⁶⁸

Group therapy creates a microcosm of real-world relationships and interpersonal difficulties for patients. Group therapy can be less intense for potentially violent patients and their therapists in terms of transference and countertransference reactions. Interactions with other group members through a course of therapy can be a source of modeling for aggressive patients. Groups also provide supportive confrontations and conflict resolution. Family and couples therapy can be more problematic if the victim and the perpetrator are treated together, as it can be difficult to assign responsibility for the violence appropriately. The perpetrator will tend to rationalize the aggression in the family as an appropriate response to instigation. Continuing violence in the relationship during treatment is another obstacle to overcome.⁶⁸ Early detection of abuse and domestic violence, combined with proper therapeutic methods, can be important in decreasing the chance for future violence in children and adolescents.²³

CASE EXAMPLE, CONTINUED

After JB's medication regimen was simplified, medication used to address the violent behavior was limited to only haloperidol 5mg up to every four hours as needed for agitation. Staff observed that he responded well to positive and consoling statements by female nurses and attendants. He began requesting to be able to lie

quietly in the seclusion room with a staff member watching him, while the door remained open and unlocked. These environmental accommodations were made, and the patient's aggressive incidents and time spent in restraints began to decline. He was able to be involved in group activities on the unit and receive visits from supportive family members. His depression was persistent, however. In view of the refractory nature of his symptoms, he underwent a course of electroconvulsive therapy.

PHARMACOLOGICAL INTERVENTIONS

Acute violent behavior. In addition to environmental modifications and psychotherapy, pharmacotherapy certainly has a place in treating and controlling violent behavior. Many of the practices in medicating acute aggression are based in and developed from clinical experience and personal observation. There is limited empirical data regarding appropriate pharmacologic choices.

Pharmacological considerations involve more than just the choice of medication; it also includes the clinician's presentation of options to the patient and the route of medication administration. When possible, it is best to offer the patient a choice as to which type or route of medication will be used to help him or her regain self control. The act of the patient making this choice facilitates good judgment and control, potentially heading off further frustration and agitation while preserving dignity for all involved.⁴ Since oral administration of most of these agents is generally as effective as parenteral dosing, taking the medication by mouth offers an opportunity for the patient to regain some self efficacy in treatment. However, violent patients may summarily refuse treatment with medications. In this emergency setting (with impending harm to self and/or others), this treatment refusal is usually overruled, and medication is administered against the patient's will, for the safety of the treatment

community.

High-potency first-generation neuroleptics have been the agents of first choice for the treatment of acute aggression since their inception, especially when such aggressive behavior seems to be motivated or aggravated by psychotic symptoms. These medications, such as haloperidol and fluphenazine, are used alone or in combination with a quick-acting benzodiazepine, such as lorazepam, for added sedation. Reasonable doses of these medications—5mg for the neuroleptics and 2 to 3mg for the benzodiazepine—can be given orally or intramuscularly and repeated every 1 to 2 hours until the patient's aggression has ceased.⁶² Haloperidol, in particular, has been shown repeatedly in the literature to be safe in patients, even if their medical histories are unknown. In particular, haloperidol has minimal effects on cardiac status and seizure threshold.⁴ Markedly higher doses of these neuroleptics, a more common practice in past decades, can actually worsen aggression, largely due to dose-related side effects, especially akathisia and dystonias.⁶² When more sedation as well as antipsychotic properties are desired, chlorpromazine in oral doses of 100 to 200mg can quiet aggressive behaviors quickly, with cautious observation for anticholinergic and orthostatic side effects.¹² Monotherapy with benzodiazepines can also be useful in treating aggression, especially those agents with quicker onsets of action.⁴ Lorazepam is commonly chosen, perhaps because of its reliable intramuscular administration. Benzodiazepines carry a small but real risk of disinhibition and paradoxical aggression.

Preliminary data on new intramuscular and rapidly dissolving formulations of several second-generation antipsychotics, including risperidone, olanzapine, and ziprasidone, suggest that they are comparable in efficacy to haloperidol for managing acute aggression. These formulations may facilitate the eventual transition over to chronic

maintenance with their oral counterparts. Data also suggest these newer medications may demonstrate more favorable side effect profiles in emergency situations.⁶⁹ However, manufacturers of each agent detail specific warnings in the package inserts of these new preparations, including concern for corrected QT prolongation with ziprasidone and excessive sedation and cardiorespiratory depression if olanzapine is combined with benzodiazepines intramuscularly.

Chronic aggression. The risk of violence decreases when psychiatric symptoms are treated successfully; this concept underscores the importance of accurate diagnosis and comprehensive treatment of chronically aggressive patients. Some targeted pharmacotherapy may help control violent behaviors in psychiatric patients when treatment of the underlying disorder is not enough to prevent hostile incidents. This directed therapy can assist chronic patients in living more successfully in a community environment.

Available evidence maintains that second-generation antipsychotics should be considered the treatment of choice for chronic aggression, given their efficacy and favorable tolerability in the long term.⁶² In particular, clozapine is recommended for persistent violence in the setting of psychosis, especially refractory conditions. Several studies have shown that clozapine is effective in controlling aggression and reduces the use of restraint and seclusion in state hospital settings.⁷² Volavka and colleagues showed that clozapine lessened hostility, separate from improving psychosis.⁷¹ Other second-generation antipsychotics, such as risperidone, olanzapine, and quetiapine, have shown equal efficacy in psychiatric patients with chronic violent behavior as compared to traditional neuroleptics. They have also shown benefit in aggression associated with autism or dementia.¹²

Lithium has displayed effectiveness for aggression in mentally retarded populations, with serum

concentrations of 0.6 to 1.4mEq/L reducing violent incidents by 50 to 73 percent in separate samples.⁷² Lithium has also repeatedly been shown to reduce irritability and incidents of aggression in patients diagnosed with bipolar disorder. Valproate has been shown to promote significant reductions in aggression, across multiple diagnostic categories, including organic syndromes, dementia, mental retardation, and bipolar disorder.⁷³ In addition, carbamazepine decreases agitation in brain-injured patients.⁷⁴

Selective serotonin reuptake inhibitors have established efficacy in decreasing aggression in populations with various psychiatric diagnoses, including Alzheimer's disease, autism, mental retardation, psychosis, posttraumatic stress disorder, and personality disorders.⁷² A three-month, double-blind study of 21 patients with borderline personality disorder showed a decrease in anger after receiving therapeutic dosages of fluoxetine, apart from changes in their depressive symptoms.⁷⁵ One multicenter trial found that citalopram was more effective than placebo in controlling aggression and irritability in patients with Alzheimer's-type dementia.⁷²

B-blockers have been tried as an adjuvant treatment to help control violent incidents in patients with a variety of symptoms. In patients recently hospitalized for traumatic brain injury, propranolol (up to 420mg/day) was found to be more effective than placebo in reducing agitation in 21 subjects.⁷² Ratey and colleagues examined 41 chronic inpatients with psychosis and found that nadolol (40–120mg/day) combined with other psychotropics, resulted in significant improvements in aggression and hostility scores as compared with placebo.⁷⁸

SUMMARY

Violence has serious implications for society and psychiatric practice, directly and indirectly affecting the quality of life of patients, their families, the community, and mental health workers. The specter of

violence in psychiatric practice demands risk stratification and management as part of the complete patient assessment. Any modifiable risk factor must be addressed by psychiatrists while working with inpatient and outpatient treatment teams. Psychotherapy and pharmacotherapy are used both in the emergent circumstance and throughout the course of illness.

This review of the available literature on violence and aggression supports this notion that such symptoms are often a consideration in providing care psychiatric patients. We can conclude from the information in this review that individuals with mental illness, when appropriately treated, do not pose any increased risk of violence over the general population. Violence may be more of an issue in patients diagnosed with personality disorders and substance dependence. The overall impact of mental illness as a factor in the violence that occurs in society as a whole appears to be overemphasized, possibly intensifying the stigma already surrounding psychiatric disorders. Violence and mental illness are not without connection, however, as they share many biologic and psychosocial aspects.

In the future, research may focus on discovering useful factors in the development of aggression, which would shed light on preferred treatment methods. Understanding factors contributing to violence and appropriately developing a risk management plan to address those factors will hopefully contribute to further eliminating stigma and other obstacles confronting psychiatric patients, helping them to achieve a good quality of life and independence in the community.

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