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Intermittent Explosive Disorder

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Intermittent explosive disorder (IED) is a DSM diagnosis that has come into use to describe the pathology of people with impulsive aggression. Surprisingly, many clinicians and researchers rarely consider the diagnosis of IED, although impulsive aggressive behavior is relatively common. In community surveys, 12%–25% of men and women in the United States reported engaging in physical fights as adults, a frequent manifestation of impulsive aggression (Robins and Regier 1991). Impulsive aggressive behavior usually is pathological and causes substantial psychosocial distress/dysfunction (Mattes 1990; McElroy et al. 1998). Being on the receiving end of impulsive aggressive behavior can lead to similar behavior in a child who grows up in this environment (Huesmann et al. 1984). A description of the development of IED diagnostic criteria and information about the epidemiology, genetics, neurobiology, and treatment of impulsive aggression are included in this chapter.

Nosology

DSM-I Through DSM-III-R

Prior descriptions of impulsive aggressive behavior fell under the labels of Type A personality, passive-aggressive personality (aggressive type), or explosive personality. Until most recently, little research was done using categorical expressions of impulsive aggression due to difficulties with the DSM criteria. This section describes the process by which the current research criteria for IED were developed.

"Intermittent explosive disorder" was named for the first time in DSM-III (American Psychiatric Association 1980). However, these criteria were not specific enough to make the diagnosis in more than a handful of subjects. The IED diagnostic criteria were revised for DSM-III-R (American Psychiatric Association 1987), but they proved to be overly restrictive. IED could only be diagnosed by DSM-III-R in 20% of violent male volunteers with clinically impulsive aggressive pathology, due in no small part to the exclusion of generalized impulsive aggressive behavior in between aggressive outbursts (Felthous et al. 1991).

Research Criteria for Intermittent Explosive Disorder–Revised

To use an IED diagnosis in research studies, research criteria were created. The research criteria for IED–revised (IED-R) described five criteria for IED, emphasizing the severity, impulsive nature, frequency, and pathology of the impulsive aggressive behavior. Less severe impulsive aggressive behavior (i.e., verbal aggression or aggression toward property) was included because these forms of aggression had been shown to respond to treatment (Coccaro and Kavoussi 1997; Salzman et al. 1995). The criteria also specified that *impulsive,* not *premeditated* aggression would be required for this diagnosis. Prior research had shown psychosocial, biological, and treatment response findings specific to only impulsive and not premeditated aggression. A minimal frequency of aggressive acts was required to increase the reliability of the IED diagnosis and exclude those without severe symptoms. Finally, to distinguish the IED diagnosis as pathological, the criteria required the presence of subjective distress and/or social or occupational dysfunction.

The new IED-R criteria also included inclusion/exclusion changes. The past exclusion of subjects with borderline personality disorder (BPD) and

antisocial personality disorder (ASPD) had seemed reasonable at the time of the publication of DSM-III. Individuals with BPD are diagnosed in part by their impulsivity and frequent expressions of anger, and those with ASPD are often irritable and aggressive. Impulsive aggression, however, is not present in all BPD/ASPD subjects. Moreover, familial, twin, biological, and treatment response data suggest that impulsive aggressive behavior, although present in many BPD/ASPD subjects, has specific clinical relevance separately from the remaining diagnostic features of these personality disorders (Barratt et al. 1997; Coccaro et al. 1989; Cowdry and Gardner 1988; Linehan et al. 1994; Moss et al. 1990; Sheard et al. 1976; Silverman et al. 1991; Torgerson 1984).

Other mental illnesses with impulsive aggressive outbursts include bipolar disorder, major depression, substance abuse, and mental retardation; these, among others, should be excluded from an IED diagnosis. Although most impulsive aggressive behaviors occurring in patients with these disorders can be explained by the primary diagnosis, aggressive outbursts occurring in the context of major depression (Fava et al. 1993) may be particularly difficult to distinguish from IED. However, irritability and aggressive outbursts occurring only during an episode of major depression are most likely due to the depression, and thus comorbid IED should not be diagnosed unless there is evidence that impulsive aggressive behavior occurs in the absence of major depressive episodes.

Application of Intermittent Explosive Disorder—Revised Criteria

A study of DSM-III-R IED versus IED-R criteria was first published in 1998 with 188 subjects with personality disorder, nearly half of whom were seeking treatment for impulsive aggressive behavior (Coccaro et al. 1998b). A very low 2% of subjects met DSM-III-R IED criteria (10% would have met DSM-IV [American Psychiatric Association 1994] criteria). In contrast, 40.4% met IED-R criteria. The subjects diagnosed by either set of criteria had many characteristics that differentiated them from non-IED subjects, including elevated aggression and impulsivity scores. IED subjects had lower Global Assessment of Functioning scores compared with non-IED subjects even when age, race, gender, and other relevant variables were accounted for. Current and past mood disorders, as well as alcohol and substance dependence, were more frequently found in those with IED but did not affect these findings. Subjects

with IED were more likely to have BPD, although most (62%) did not have either BPD or ASPD. Moreover, aggression and impulsivity scores were still elevated when the comorbidity of these disorders was accounted for, indicating that features of the IED subjects were not due to BPD/ASPD.

IED-R and DSM-IV Criteria: Defining Integrated Research Criteria for Intermittent Explosive Disorder

Although DSM-IV made some changes to the IED criteria, it still did not provide criteria useful for research. The "aggressive acts" of criterion A did not give specific definitions for its terms or a number of acts or time frame during which the acts had to occur. Apparently, no official guidelines for these items had been determined or considered by the DSM-IV subcommittee.

Clinically, subjects with impairment from IED may fit a variety of descriptions. Example of descriptions include 1) subjects with frequent, small-scale, nonassaultive/nondestructive explosive episodes associated with distress and/or impairment (IED-R); 2) subjects with relatively infrequent but severely assaultive/destructive episodes in addition to frequent small-scale, less severely assaultive/destructive episodes (both IED-R and DSM-IV IED); and 3) subjects with relatively infrequent but severely assaultive/destructive episodes (DSM-IV IED). Using research criteria for IED-R and DSM-IV IED in the same subjects used in the original IED-R series, 69% of subjects met both IED-R and DSM-IV IED diagnoses, 20% met criteria for only DSM-IV IED, and 11% met criteria for only IED-R. Analyses done to compare subject groups found no differences in aggression and impulsivity levels and a significant difference between the total IED group and non-IED subjects. Because the two criteria sets did not differentiate groups with different aggression and impulsivity levels, and each alone leaves a number of subjects undiagnosed, integrated research criteria (IED-IR) were created to allow subjects from any or both of these groups to be identified.

Epidemiology

DSM-IV-TR (American Psychiatric Association 2000) describes IED as "apparently rare." However, clinical interview or survey data give a different picture. A number of studies have looked at clinical populations, and one community survey has been done to determine the prevalence of IED. Num-

bers range between 1.1% and 6.3%. The evaluation of studies is complicated by the variety of defining criteria used, from DSM-III to current research criteria and IED-IR. Initially, Monopolis and Lions (1983) reported that only 1.1% of hospitalized patients met DSM-III criteria for IED. More recently, Zimmerman et al. (1998) used the Structured Clinical Interview for DSM-IV (SCID) to study current or lifetime IED in 411 outpatient psychiatric subjects at Rhode Island Hospital. They reported a rate of 3.8% for current IED and 6.2% for lifetime IED by DSM-IV criteria. A recent reanalysis of a much larger sample from the same population revealed similar rates of IED (Coccaro et al., in press). Moreover, data from a pilot community sample study revealed a community rate of lifetime IED by DSM-IV-TR criteria at 4.0% and by IED-IR criteria at 5.1% (Coccaro et al. 2004). Considering the rates found in these more recent studies, IED could be as common as other major psychiatric disorders such as schizophrenia or bipolar illness.

Clinical Features

The age of onset and course of IED distinguish the disorder as separate from its comorbid diagnoses. A mean age at onset of 16 years and an average duration of about 20 years has been described for IED (McElroy et al. 1998). Preliminary data from the Rhode Island Hospital Study (Coccaro et al., in press) confirm these findings and indicate that onset of IED by DSM-IV-TR is seen by the end of the first decade in 31%, by the end of the second decade in 44%, by the end of the third decade in 19%, and by the end of the fourth decade in only 6%. IED comes on rapidly, without a prodromal period. Aggressive episodes typically last less than 30 minutes and involve one or a combination of the following: verbal assault, destruction of property, or physical assault. If any provocation is identifiable, it is from a known person and is seemingly minor in nature (Felthous et al. 1991; Mattes 1990; McElroy et al. 1998). As discussed earlier, many IED subjects who have severely aggressive/destructive episodes frequently have minor aggressive episodes in the interim. Substantial distress, social, occupational, legal, or financial impairments typically result from these episodes. Data on gender differences in IED are limited, but most published data suggest that males outnumber females in this regard. More recent, unpublished data from the Rhode Island Hospital Study (Coccaro et al., in press), however, suggest that the male:female ratio is closer to 1:1.

Comorbidity With Axis I and II Disorders

Subjects with IED most frequently have other Axis I and II disorders. The most frequent Axis I diagnoses comorbid with IED lifetime include mood, anxiety, substance, eating, and other impulse-control disorders ranging in frequency from 7% to 89% (Coccaro et al. 1998b; McElroy et al. 1998). Such Axis I comorbidity rates raise the question of whether IED constitutes a separate disorder. However, recent data finding earlier onset of IED compared with all disorders, except for phobic-type anxiety disorders, suggest that IED is not secondary to these other disorders (Coccaro et al., in press). That noted, the possible comorbidity with bipolar disorder and other impulse-control disorders deserves more detailed consideration.

Bipolar Disorder

McElroy et al. (1998) reported that the aggressive episodes observed in their subjects resembled "microdysphoric" manic episodes. Symptoms in common with both manic and IED episodes included irritability (79%–92%), increased energy (83%–96%), racing thoughts (62%–67%), anxiety (21%–42%), and depressed (dysphoric) mood (17%–33%). However, this finding may not be surprising, because 56% of the subjects in question had a comorbid bipolar diagnosis of some type (bipolar I, 33%; bipolar II, 11%; bipolar not otherwise specified or cyclothymia, 11%). Two other studies suggest a much lower rate of comorbid bipolar illness, with rates of 11% (bipolar I, 5%; bipolar II, 5%; bipolar not otherwise specified, 1%) noted in the Rhode Island Hospital Study (Coccaro et al., in press) and only 10% (bipolar II only) noted by Gavlovski et al. (2002). Regardless, clinicians should fully evaluate for bipolar disorder prior to determining treatment for IED, because mood stabilizers, rather than selective serotonin reuptake inhibitors (SSRIs), would be the first-line treatment for IED comorbid with bipolar disorder.

Other Impulse-Control Disorders

McElroy et al. (1998) reported that up to 44% of their IED subjects had another impulse-control–type disorder such as compulsive buying (37%) or kleptomania (19%). In the Coccaro et al. (1998b) study, however, few IED

subjects had a comorbid impulse-control disorder, and only 5% of IED subjects had another impulse-control disorder in the Rhode Island Hospital Study (Coccaro et al., in press).

Borderline and Antisocial Personality Disorders

The rate of BPD and/or ASPD in IED subjects has been reported at 38% (Coccaro et al. 1998b). However, rates of IED in subjects with BPD have been noted at 78% and in subjects with ASPD at 58% (Coccaro et al. 1998b). A review of unpublished data from the author's (E.H. Hollander 2005) research program suggests that these rates are lower among subjects not seeking treatment and are lowest in the community (23% for BPD and/or ASPD; Coccaro et al. 2002). Regardless, BPD and ASPD subjects with a comorbid diagnosis of IED do appear to have higher scores for aggression and lower scores for general psychosocial function than do BPD/ASPD subjects without IED (Coccaro et al., in press).

Pathogenesis

Familial and Genetic Correlates

Family and Twin Studies

Clinical observation and family history data suggest that IED is familial. Violent behavior or a history of violent behavior in probands correlates with violent behavior in first-degree relatives (Bach-Y-Rita et al. 1971; Maletsky 1973). Familial aggregation of temper outbursts and IED has been reported in psychiatric patients with "temper problems" (Mattes and Fink 1987), and McElroy et al. (1998) reported that nearly a third of first-degree relatives of IED probands had IED. A recent blinded, controlled, family history study using IED-IR criteria (Coccaro 1999) found a morbid risk of IED of 26% in relatives of IED-IR probands compared with 8% among the relatives of control probands, a significant difference. Although twin studies have confirmed the hypothesis that both impulsivity (Seroczynski et al. 1999) and aggression (Coccaro et al. 1997a) are under substantial genetic influence, there are no twin studies of IED itself. Genetic influence for these two traits ranges from 28% to 47%, with nonshared environmental influences making up the lion's share of the remaining variance.

Molecular Genetic Studies

Studies of particular genes in aggressive populations have used the candidate gene approach. Candidate genes are those genes for proteins with a suspected, or proven, biological association to a disorder (e.g., serotonin [5-HT] receptors in aggression). The polymorphism HTR1B/G861C and short tandem repeat locus D6S284 are part of the gene for the 5-HT_{1B} receptor for serotonin. These genetic sites were examined in 350 Finnish sibling pairs and in 305 Southwestern American Indian sibling pairs, both with a high rate of alcoholism. The diagnoses of ASPD and IED were used to examine the traits of impulsivity and aggression. The rate of IED in relatives of ASPD probands was 15%, and the relatives of healthy control subjects had neither IED nor ASPD. Lappalainen et al. (1998) were able to discover that the gene predisposing to ASPD alcoholism resides close to the HTR1B version of the coding sequence. They concluded that impulsivity and aggression might be influenced, in part, by 5-HT_{1B} receptors. Other candidate genes include the genes for tryptophan hydroxylase and monoamine oxidase A. Manuck et al. (1999, 2000) revealed an association of the traits of aggression, impulsivity, and serotonin activity (tested by *d,l-Fen* challenge) with variations in both the tryptophan hydroxylase and monoamine oxidase A genes in community samples.

Biological Correlates

Serotonin

Serotonin and other centrally acting neurotransmitters are the most studied biological factors in aggression. Measures examining central (as well as peripheral) serotonin function correlate inversely with life history, questionnaire, and laboratory measures of aggression. This relationship has been demonstrated by cerebrospinal fluid 5-hydroxyindoleacetic acid (G.L. Brown et al. 1979; Linnoila et al. 1983; Virkkunen et al. 1994), physiological responses to serotonin agonist probes (Coccaro et al. 1989, 1997b; Dolan et al. 2001; Manuck et al. 1998; Moss et al. 1990; O'Keane et al. 1992), and platelet measures of serotonin activity (Birmaher et al. 1990; C.S. Brown et al. 1989; Coccaro et al. 1996; Stoff et al. 1987). The type of aggression associated with reduced central serotonin function appears to be *impulsive,* as opposed to *nonimpulsive,* aggression (Linnoila et al. 1983; Virkkunen et al. 1994). These findings suggest that impulsive aggressive behavior can be distinguished biologically from nonimpulsive aggression.

Other Neurotransmitter Systems: Dopamine, Norepinephrine, Vasopressin, and Brain-Derived Neurotrophic Factor

There is also emerging evidence to support the role of other nonserotonergic brain systems and modulators in impulsive aggression. These findings suggest a facilitating role for dopamine (Depue et al. 1994), norepinephrine (Coccaro et al. 1991), vasopressin (Coccaro et al. 1998a), brain-derived neurotrophic factor (BDNF; Lyons et al. 1991), opiates (Post et al. 1984), and testosterone (Archer 1991; Virkkunen et al. 1994) and an inhibitory interaction between neuronal nitric oxide synthase and testosterone in rodents (Kriegsfeld et al. 1997). The relationship of catecholamines and vasopressin to aggression and serotonin is noteworthy. The inverse relationship between aggression and serotonin is not observed when catecholamine system function is impaired. Among depressed subjects, who typically demonstrate diminished norepinephrine system function, the relationship between serotonin and aggression is not found (Coccaro et al. 1989; Wetzler et al. 1991). In the case of central vasopressin and aggression, serotonin appears to be inversely related to both central vasopressin and to aggression in both animal (Ferris and Delville 1994) and human subjects (Coccaro et al. 1998a). In human subjects, the relationship between central vasopressin and aggression is present even after the relationship with serotonin is taken into account. In animal studies, both central vasopressin activity and aggression can be suppressed by treatment with SSRI agents (Ferris and Delville 1994). In other animal studies, SSRI agents were able to suppress the overaggressiveness of mice deficient in BDNF (BDNF± mice), revealing a role for BDNF in both aggressiveness and serotonin regulation (Lyons et al. 1991).

Imaging and Brain Localization

The availability of modern imaging devices, especially functional imaging, allows for examination of the neurocircuitry of emotion and behavior. Although many localization and functional studies have been done in the depressed population, few studies have looked at impulsive aggression or IED. Soloff et al. (2000) used fluorodeoxyglucose positron emission tomography (FDG-PET) and serotonin stimulation to compare brain activity of BPD patients with that of normal control subjects. Prior to stimulation, the

control group had greater uptake in all regions examined. However, the BPD patients had decreased uptake in the medial and orbital regions of the right prefrontal cortex, areas associated with impulsive aggression. Similarly, in the context of FDG-PET, Siever et al. (1999) found blunted glucose utilization responses to serotonin stimulation in the orbitofrontal cortex of IED subjects with BPD. More recently, New et al. (2002) reported a similar finding in the anterior cingulate after stimulation with the direct serotonin agonist *m*-chlorophenylpiperazine.

Parsey et al. (2002) used PET with a 5-HT_{1A} antagonist to examine the relationship between serotonin receptor binding and lifetime aggression. Looking at the dorsal raphe, anterior cingulate cortex, cingulate body, hippocampus, amygdala, medial prefrontal cortex, and orbital prefrontal cortex, all areas except the cingulate and hippocampus demonstrated association with lower serotonin binding and aggression. The study was done in healthy volunteers. Best et al. (2002) provided support for a possible dysfunctional frontal circuit using neuropsychological testing performance in subjects with impulsive aggression. Further work in this area of emotion regulation, and new attention to the abnormalities in information processing, will likely reveal more specifics of functional brain abnormalities in individuals with impulsive aggression.

Treatment

There are few studies in which subjects with IED have been the focus of treatment. A number of studies in which the treatment of impulsive aggression in related subjects has been examined are reviewed in the following sections.

Psychotherapy

Anger treatment studies focus on treatment of anger as a component of other psychiatric illnesses. It is true that anger can largely contribute to the dysfunction caused by a disorder, particularly in adolescents or children; in patients with substance abuse, posttraumatic stress disorder, depression, and domestic violence; and in forensic and mentally impaired populations. In these cases, therapy for anger and aggression focuses on cognitive-behavioral group therapy. In a few rare cases, anger is addressed as the primary or only problem,

and a limited number of treatments have been described. "Imaginational exposure therapy," used frequently in anxiety disorders, was studied by Grodnitzky and Tafrate (2000) in a noncontrolled pilot study of anger treatment. Subjects habituated to anger-provoking scenarios, and the treatment was felt to be useful. Studies on driving anger provide the only controlled studies of anger treatment in a population without other psychopathology. Deffenbacher et al. (2000) reported on an initial controlled trial comparing two treatments versus an assessment-only control condition in a self-identified, high–driving anger population of college-student volunteers who received research credit for participation. Group treatment conditions consisted of pure relaxation training compared with relaxation training combined with cognitive therapy and an assessment-only control. Neither treatment condition demonstrated improvement on general trait anger, but both active treatments improved driving anger. The same researchers repeated these interventions in a different population using drivers with higher anger levels than in the first study (Deffenbacher et al. 2002). This time, both treatments lowered trait anger. The second study gave some attention to the generalization of skill use to other sources of anger. Overall, because relaxation training with cognitive therapy provided little gain over pure relaxation training, relaxation training in itself may be an adequate treatment for driving anger.

Other versions of cognitive-behavioral therapy, such as Marsha Linehan's dialectical behavior therapy, have been studied in BPD patients. A study in 26 BPD subjects showed improvement in anger, social adjustment, and global functioning compared with a treatment-as-usual condition (Linehan et al. 1994). In addition, studies of dialectical behavior therapy have been done in subjects with many diagnoses, and improvement in impulsivity and anger scores has been shown. No double-blind, placebo-controlled studies on IED subjects in therapy have been published, but studies of therapy in IED subjects are ongoing.

Pharmacotherapy

A number of medications in different classes have been used to treat impulsive aggression, from tricyclic antidepressants to benzodiazepines, mood stabilizers, and neuroleptics. Most recently, studies of the pharmacotherapy of aggression have turned to SSRIs and mood stabilizers as first-line treatments.

Fluoxetine and other SSRIs have been studied in IED patients and impulsive aggressive subjects. In our published fluoxetine treatment trial of subjects meeting IED-IR criteria, impulsive aggressive behavior did respond to fluoxetine (Coccaro and Kavoussi 1997). The past use of non-serotonin-specific antidepressants in impulsive aggression had little benefit and many side effects in treatment studies. Soloff et al. (1986a) looked at amitriptyline in a group of inpatients with BPD and schizotypal personality disorder. Although affective symptoms improved during the 5-week study in some patients, there was a set of patients with worsening of impulsivity and aggression. This worsening could have been due to the noradrenergic effects of tricyclic antidepressants (Links et al. 1990). Accordingly, the use of the new dual-action antidepressants in these patients should be approached with caution.

Monoamine oxidase inhibitors such as tranylcypromine and phenelzine have also been studied in impulsively aggressive subjects. Soloff et al. (1993) examined the response of BPD patients to treatment with phenelzine versus haloperidol. Compared with placebo and haloperidol, phenelzine produced a moderate reduction in anger and hostility in this double-blind comparison. However, a 16-week continuation phase revealed that the subjects had experienced only minor benefits in depression and irritability, and the subjects remained substantially impaired after the treatment phase (Cornelius et al. 1993; Soloff et al. 1993). Cowdry and Gardner's (1988) study of tranylcypromine, trifluoperazine, alprazolam, and carbamazepine in patients with treatment-resistant BPD (all of whom had a substantial history of impulsive aggressive outbursts) revealed little benefit for tranylcypromine. This double-blind, placebo-controlled crossover study was also of interest due to the results from the other medications. Cowdry and Gardner (1988) revealed a worsening of behavior among subjects given alprazolam. Episodes of serious dyscontrol increased in frequency among those subjects with a history of similar episodes and BPD. The authors theorized that the benzodiazepine treatment might have released the subjects' control or inhibition of these episodes. Treatment of such patients with benzodiazepines should only be instituted under close watch and after considering the other options.

Mood stabilizers have also been used to treat aggression. Initially, controlled trials examined lithium and its affects on mood and impulsive aggression in two different populations, BPD outpatients and chronically aggressive prisoners. Links et al. (1990) compared lithium with desipramine and pla-

cebo. Objective ratings of anger and suicidality improved the most on lithium; however, the subjects and their clinicians did not report any improvement in mood. Sheard et al. (1976) found an improvement using lithium versus placebo in chronically aggressive prisoners. However, again, only objective findings supported this; subjectively, no improvement was reported. Barratt et al. (1997) also reported a reduction in aggression with diphenylhydantoin treatment in impulsively aggressive prison inmates.

The other mood stabilizers studied for impulsive aggression have been carbamazepine and divalproex. Referring back to the Cowdry and Gardner (1988) study, carbamazepine did lessen episodes of impulsive aggression in BPD subjects. However, 18% of these subjects noticed a worsening in their mood, which improved once carbamazepine was stopped. Recently, Kavoussi and Coccaro (1998) and Hollander et al. (2003) reported an antiaggressive effect of divalproex sodium in IED subjects with a Cluster B personality disorders. Divalproex reduced overt aggression scores to a greater degree than did placebo, especially by the third month of treatment. Surprisingly, IED subjects without a Cluster B personality disorder responded equally well to divalproex and placebo. Reasons for an absence of a differential antiaggressive effect of divalproex in this population is unknown at this time. Given the relative adverse event profiles for SSRIs versus mood stabilizers, it is likely that clinical treatment of IED patients should start with SSRIs unless the subject is extremely aggressive or has a history of a bipolar disorder, in which case treatment with a mood stabilizer would be more appropriate.

The neuroleptics haloperidol, trifluoperazine, and depot flupenthixol have all been studied in BPD populations. In Cowdry and Gardner's (1988) study, subjects showed significant improvement in depression and anxiety objective ratings with trifluoperazine; however, subjective ratings did not support this finding. Trifluoperazine was seen as less useful than tranylcypromine (a monoamine oxidase inhibitor) and carbamazepine in improving behavior and affect among the subjects. Soloff et al. (1986b, 1989) examined haloperidol versus amitriptyline in hospitalized BPD patients with or without schizotypal personality disorder. These subjects improved on hostility and global function measurements, but considerable depression remained. Soloff afterward described haloperidol as a nonspecific tranquilizer in BPD patients. A 6-month study of depot flupenthixol by Montgomery and Montgomery (1982) found decreased suicidal and parasuicidal behavior in the treatment group compared with the

placebo group among individuals with a history of such behaviors.

Atypical antipsychotics provide a new class of possible treatments for impulsive aggressive behavior. Few studies in this area are controlled trials. Zanarini and Frankenburg (2001) compared olanzapine with placebo in outpatients with BPD. The treatment improved anger, hostility, and other symptoms, but not depression. The patients remained quite ill.

Conclusion

As a diagnostic entity, IED has been poorly characterized over the years. However, the behavioral phenomenon underlying IED (i.e., impulsive aggression) has been well studied for more than two decades, and research in this area has led to important insights into the biology and treatment of the core behaviors in IED. Given the emerging evidence suggesting several treatment options that may effectively reduce impulsive aggressive behavior, IED should now be systematically investigated so that patients with this disorder can be offered potentially efficacious treatments (psychopharmacological and/or cognitive-behavioral treatments) and can be identified for further research in this area.

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