Psychiatr Q (2010) 81:239–251
DOI 10.1007/s11126-010-9133-3

ORIGINAL PAPER

Aggression in Borderline Personality Disorder

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Published online: 14 April 2010

Abstract This review examined aggressive behavior in Borderline Personality Disorder (BPD) and its management in adults. Aggression against self or against others is a core component of BPD. Impulsiveness is a clinical hallmark (as well as a DSM-IV-TR diagnostic criterion) of BPD, and aggressive acts by BPD patients are largely of the impulsive type. BPD has high comorbidity rates with substance use disorders, Bipolar Disorder, and Antisocial Personality Disorder; these conditions further elevate the risk for violence. Treatment of BDP includes psychodynamic, cognitive behavioral, schema therapy, dialectic behavioral, group and pharmacological interventions. Recent studies indicate that many medications, particularly atypical antipsychotics and anticonvulsants, may reduce impulsivity, affective lability as well as irritability and aggressive behavior. But there is still a lack of large, double blind, placebo controlled studies in this area.

Keywords Borderline personality disorder · Aggression · Cognitive behavioral therapy · Dialectical behavioral therapy · Group Therapy · Anticonvulsants · Antipsychotics · Psychotherapy · Pharmacotherapy

Introduction

Patients with borderline personality disorder, mainly with impulsive-behavioral dyscontrol symptoms, exhibit impulsive aggression, self-mutilation, or self-damaging behavior (e.g., promiscuous sex, substance abuse, reckless spending). Aggression against self or against others is one of core components of the borderline personality disorder (BPD). These two types of aggression share certain underlying neurobiological mechanisms [1], but their impact on clinical care, patient's environment, and legal involvement is different. Unlike

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self-injurious behavior, aggression against others obviously endangers caregivers, family members, and other patients. Finally, unlike self-injurious behavior, aggression against others may carry legal penalties for the perpetrator. The purpose of this review is to examine aggressive behavior in BPD and its management.

Methods

PUBMED data base was searched for articles using the combination of key words "aggression" and "borderline personality disorder". The search was then repeated after the key word "aggression" was replaced by "violence". For the pharmacological treatment searches, generic names of mood stabilizers, antidepressants and antipsychotics were used in combination with key words "borderline personality disorder" and "aggression". No language or time constraints were applied. Articles dealing with children and adolescents were not included. The lists of references of the articles detected by this computer data base search were examined manually to find additional articles.

Definitions

Aggression is overt behavior involving intent to inflict noxious stimulation or to behave destructively towards another organism or object [2, p. 2]. The term "*violence*" is frequently used to denote aggression in humans. *Hostility* may include overt or covert aggression, uncooperativeness, suspiciousness, and other unfriendly attitudes. *Agitation* is an excessive verbal or motor behavior [3]. It may occur concurrently with aggression. *Anger* is an emotional state that varies from mild irritation to intense rage. It is a common precursor to overt aggressive behavior.

Results

Prevalence of Aggressive Behavior in BPD

DSM-IV-TR stipulates "inappropriate, intense anger or difficulty controlling anger (e.g. recurrent physical fights") as one of the diagnostic criteria for BPD. Thus, since the diagnosis is partly defined by the presence of aggression, estimating prevalence of this behavior in BPD is to some extent circular.

Among BPD subjects followed in a longitudinal study, 58% have been involved 'occasionally or often' in physical fights as adults; 25% have used weapons against others [4]. There are numerous reports suggesting elevated levels of aggressive behavior in BPD based on various rating scales [5–9], but it is not possible to derive prevalence in terms of an absolute number of aggressive incidents in a period of time from these scales. Such scales are suitable to measure time changes in the relative levels of aggression or of proxy measures such as hostility, anger, impulsiveness, or irritability, and therefore are used in psychopharmacological studies that will be described below.

BPD was not one of the diagnoses included in the large epidemiological studies that provided prevalence data on violence for many psychiatric disorders [10–12]. Thus, although there is agreement that patients with BPD are at risk for violent behavior [13], numerical estimates of that risk are not yet available. This is an important knowledge gap,

particularly in view of the fact that the prevalence of BPD observed in a recent large epidemiological study was 5.9% [14] (previous estimates were 1–2%).

Patients with BPD frequently have a history of childhood victimization, and clinical observations suggest that the prevalence of victimization is high also in their adult lives [15].

Clinical Aspects of Aggression in BPD

BPD is viewed as a disorder of dysregulation–dysregulation of behavior, affect, cognition, and interpersonal relationships. The chronic suicidal, self-injuring and aggressive behavior characteristic of many individuals with BPD is seen as a consequence of these dysregulations. The biopsychosocial theory attributes the dysregulation to a transaction between an inborn emotional vulnerability and an emotionally invalidating childhood environment. There are three major subtypes of aggressive behavior in persons with mental disorders: psychotic, instrumental, and impulsive. Assault by a patient responding to command hallucinations is an example of the psychotic subtype. Instrumental aggression is a planned act aimed at achieving a goal. Two inpatients may for example fight for a favorite chair; other fights may break out about the choice of the TV program to watch. This type of aggression is common in patients and non-patients. Impulsive aggression is not planned, it is caused by a lack of behavioral inhibition and unconcern about consequences.

Impulsiveness is a clinical hallmark (as well as a DSM-IV-TR diagnostic criterion) of BPD, and aggressive acts by BPD patients are largely of the impulsive type [16]. Crimes committed by BPD patients are impulsive and likely to consist in "explosive episodes of physical violence", whereas those committed by patients diagnosed with antisocial personality disorder are more goal-oriented (instrumental) [17]. The likelihood of aggression in BPD is increased by environmental overstimulation and stress [18].

Borderline psychopathology affects not only the likelihood and the subtype of violence committed, but also its severity. This was demonstrated in a study that assessed features of borderline personality in three groups: Murderers, Violent, and Nonviolent adult offenders [19]. Murderers had higher borderline personality scores than nonviolent offenders, and there was a linear increase in borderline scores with increasing degree of violence across the three groups. Borderline traits associated with extreme violence consisted of unstable, intense relationships and affective instability. Thus, borderline personality may predispose toward extreme forms of violence [19].

BPD has high *comorbidity* rates with conditions that are known to elevate the risk for violence. The best and most recent study of BPD comorbidity with other conditions used face-to-face diagnostic interviews with a representative sample of 34635 adults in the United States [14]. The odds ratio and 99% confidence interval for comorbidity of BPD with any substance use disorder was 3.2 (2.73–3.79), Bipolar I disorder 9.9 (8.11–12.1), Bipolar II disorder 4.3 (3.0–6.3), and Antisocial Personality Disorder 3.5 (2.71–4.40). Each of these conditions alone is well known to substantially elevate the risk for violence: this is true for substance use disorders [10, 20], bipolar disorder [21] and antisocial personality disorder [22]. The comorbidity of BPD with antisocial personality disorder was observed to be particularly criminogenic in terms of convictions for violent crime in a British community sample [23].

Incidentally, the Grant study [14] has also established inverse relationships between the odds of BPD diagnosis on one hand and the individual's education and family income: the higher the educational level and income, the lower the risk of BPD. Low income and education are known to substantially elevate the risk for violent behavior in general

population [24]. Thus, it is theoretically possible that violent behavior observed in BPD patients could be moderated by income and educational status. Future studies of BPD and violence should therefore account for variations in income and education.

Management of Aggression in BPD

Affective dysregulation and impulsive aggression are dimensions that require particular attention because they are risk factors for suicidal behavior, self-injury, assaultiveness, and interpersonal aggressiveness and are thus given high priority in selecting pharmacological agents and psychoterapeutic interventions.

Pharmacological Approaches

Psychoactive medications of all major classes have been tried in the treatment of aggressive behavior in BPD patients. The medications have been typically used as adjunctive treatments with concurrent psychotherapy. Treatment reports including an outcome measure of aggression or a proxy measure (such as anger, hostility, or belligerence) have been included in this review.

Table 1 summarizes the randomized, double-blind, placebo controlled trials of medications used in the treatment of aggression in BPD.

Amitriptyline, haloperidol, and placebo were compared in a 5-week study; haloperidol, but not amitriptyline significantly reduced hostility and belligerence in comparison with placebo [25]. Notably, amitryptyline non-responders showed increased aggressiveness during treatment. At least some patients were receiving some concurrent psychotherapy that remained unspecified.

In a similar study, phenelzine, haloperidol, and placebo were compared in a 5-week trial [26]. Phenelzine, but not haloperidol, significantly reduced hostility and irritability in comparison with placebo. In comparison with the previous study by the same group where haloperidol showed antiaggressive efficacy [25], it should be noted that the haloperidol dose in that study was lower and the outcome measure was assessed using different instruments (Table 1).

Fluoxetine showed no significant effect on aggression in comparison with placebo [27] (Table 1). A three-arm double-blind 8-week study compared olanzapine, fluoxetine, and olanzapine plus fluoxetine in BDP female patients. The outcome variable was the Overt Aggression Scale-Modified [5]. Olanzapine monotherpy and olanzapine-fluoxetine combination were superior to fluoxetine alone in reducing aggression. Fluvoxamine showed no advantage over placebo in reducing anger and impulsiveness [28] (Table 1).

Aripiprazole [29]and olanzapine [30]were superior to placebo in reducing aggressiveness and hostility, whereas ziprasidone showed no significant effect [31] (Table 1).

Three small open uncontrolled studies suggested that quetiapine may be effective in the treatment of impulsive aggression in patients with BPD [32–34]. Open studies of clozapine [35] and risperidone [36] also yielded encouraging preliminary results in the treatment of aggression in BPD.

Controlled studies of lamotrigine [37], topiramate [18, 38]and divalproex [39] have demonstrated significant superiority over placebo (Table 1) An open label trials of divalproex ER indicated antiaggressive effects in BPD patients [40].

Finally, an interesting trial of an omega-3 fatty acid compound showed superior antiagressive effects in comparison with placebo in BPD female patients [41] (Table 1).

Table 1 Randomized, double-blind, placebo-controlled trials of treatments for aggression in borderline personality disorder

	Drug	Source	Dose (mg/day)	Number of patients	Concomitant psychotherapy	Duration (weeks)	Measure of aggression	Outcome	Comment
Antidepressants	Amitriptyline	[25]	147.6 m 100–175	Amitriptyline 20 haloperidol 21 placebo 20	Yes, type unspecified	5	Hostility, belligerence (items on various scales)	No sig. effect of amitriptyline overall	Assaults by non-responding patients on amitriptyline [62, 63]
	Fluoxetine	[27]	20–40	Fluoxetine 9 placebo 11	Dialectical behavior therapy	12	Overt aggression scale-modified [5]	No effect of fluoxetine	All female subjects
	Fluvoxamine	[28]	150 f	Fluvoxamine 20 placebo 18	?	6	Borderline Personality disorder severity index [6], subscales for anger and impulsiveness	No sig. effect	After 6 weeks, study continues single-blind and then open
	Phenelzine	[26]	60.4 m	Phenelzine 38 haloperidol 36 placebo 34	?	5	Hostility/irritability on Buss Durkee inventory [7]	Phenelzine sig. better than placebo	
Antipsychotics	Aripiprazole	[29]	15 f	Aripiprazole 26 placebo 26	?	8	Aggressiveness/hostility on SCL-90-R	Stat. significant reduction	
	Haloperidol	[25]	7.2 m 4–16	Amitriptyline 20 haloperidol 21 placebo 20	Yes, type unspecified	5	Hostility, belligerence (items on various scales)	Haloperidol significantly reduced hostility and belligerence	
	Haloperidol	[26]	3.9 m	Phenelzine 38 haloperidol 36 placebo 34	?	5	Hostility/irritability on Buss Durkee inventory [7]	Haloperidol not better than placebo	Large placebo response

Table 1 continued

	Drug	Source	Dose (mg/day)	Number of patients	Concomitant psychotherapy	Duration (weeks)	Measure of aggression	Outcome	Comment
	Olanzapine	[30]	8.8 m 5–20	Olanzapine 30 placebo 30	Dialectical behavior therapy	12	Biweekly behavioral reports on impulsive/aggressive episodes	Significant reduction of impulsive/aggressive behaviors	
	Olanzapine	[64]	4.5 m 2.5–15	Olanzapine 20 placebo 20	Dialectical behavior therapy	24	Overt aggression scale-modified [5]	Trend favoring olanzapine for reduction of aggression and irritability	All female subjects selected for excessive anger
	Ziprasidone	[65]	40–200	Ziprasidone 30 placebo 30	?	12	Hostility/irritability on Buss Durkee inventory [7]	No sig. effect	
Mood stabilizers	Lamotrigine	[37]	50–200	Lamotrigine 18 placebo 9	?	8	State-trait anger expression inventory [8]	Significant reduction of anger	All female subjects
	Topiramate	[18]	50–250	Topiramate 19 placebo 10	?	8	State-trait anger expression inventory [8]	Significant reduction of anger	All female subjects
	Topiramate	[38]	50–250	Topiramate 22 placebo 20	?	8	State-Trait Anger expression inventory [8]	Significant reduction of anger	All male subjects
	Divalproex	[39]	850 m	Divalproex 20 placebo 10	?	24	SCL-90 anger/hostility group [66] modified overt aggression scale [67]	Significant reduction of anger, hostility, and aggression	All female subjects with BPD and bipolar II disorder
	Divalproex	[68]	Dose sufficient to maintain a blood level of 80 μg/mL	Divalproex 12 placebo 4	?	10	Overt aggression scale-modified [5] aggression questionnaire [9]	Trend to reduction of aggression	High dropout rate

Table 1 continued

	Drug	Source	Dose (mg/day)	Number of patients	Concomitant psychotherapy	Duration (weeks)	Measure of aggression	Outcome	Comment
Other	Omega-3 fatty acid	[41]	1000 f	Omega-3 20 placebo 10	?	8	Overt aggression scale-modified [5]	Significant reduction of aggression	All female subjects

m mean dose, *f* fixed dose

Thus, in summary, atypical antipsychotics and mood stabilizers show promise in the treatment of impulsive aggression in BDP patients. The available evidence for the efficacy of antidepressants is less impressive. It should be noted that the published trials were small. Possible confounders in these trials include comorbidity with other disorders that were largely unaccounted for, as well as variability in concurrent psychotherapy across and within trials. These problems should be addressed in future research. Approaches that require further study for anger and impulsivity are the use of naltrexone in repetitive self-harm behavior [42] and psychostimulants in impulsive borderline patients with residual adult symptoms of attention-deficit/hyperactivity disorder [43] .

Psychotherapeutic Approaches

Psychotherapy is the principal treatment method for BPD. Several studies concentrated on the impact of psychotherapy on self-injuring and suicidal behavior but only a few examined the impact on aggressiveness.

Psychodynamic Psychotherapy A psychodynamic therapy study compared the year before the start of psychotherapy with the year after the 12-month course of therapy was received in a group of poorly functioning outpatients [44]. Among the 30 completers, there were significant decreases of violent behavior, self-harm, severity of global symptoms, number of symptoms, use of illegal drugs, number of medical visits, time away from work, and hospital admissions.

The same group of 30 patients who received psychodynamic therapy was compared with 30 control subjects drawn from an outpatient waiting list who then received treatment as usual [45]. The control subjects were assessed at baseline and at varying intervals, with an average follow-up duration of 17.1 months. In this non-randomized study, the group receiving psychodynamic therapy had a significantly better outcome than the controls. The investigation has a number of limitations, including the lack of randomization, different follow-up durations for different subjects, and nonblind assessment of outcome.

Transference Focus Therapy One of the psychodynamic therapies developed for the treatment of borderline personality disorder is transference focused psychotherapy (TFP). Clarkin et al. [46] treated 23 females with BPD for 12 months in a cohort study. In comparison with the year before treatment, there were decreases of the suicidal attempts, self-mutilation, interpersonal aggressiveness, and hospitalizations days.

Mentalization Based Therapy One randomized controlled trial of 44 patients with BPD assessed the efficacy of psychoanalytically informed partial hospitalization treatment, of which Mentalization based treatment (MBT) was the primary modality in comparison with routine psychiatric care [47]. Relative to the control group, the completers of the partial hospitalization program showed significant improvement on self-mutilatory and aggressive acts. The proportion of patients who attempted suicide decreased from 95% before treatment to 5% after treatment. The 44 patients who participated in the original study were assessed at 3-months intervals after completion of the trial and results demonstrated that patients showed significant continued improvement in contrast with the control group [48].

Cognitive Behavioral Therapy Cognitive behavior therapy (CBT) assumes that maladaptive and distorted beliefs and cognitive processes underlie symptoms and

dysfunctional affect or behavior and that these beliefs are behaviorally reinforced. Utilization of cognitive behavior methods in the treatment of the personality disorders has been described [49], but because persistent dysfunctional belief systems in patients with personality disorders are usually "structuralized" (i.e., built into the patient's usual cognitive organization), substantial time and effort are required to produce lasting change. Modifications of standard approaches (e.g., schema-focused cognitive therapy, complex cognitive therapy, or dialectical behavior therapy) are often recommended in treating certain features typical of the personality disorders.

An open study assessed short term (10 sessions) CBT for patients with borderline and dissocial personality disorders displaying recurrent self-mutilation, parasuicidal attempts and increased expression of anger [50]. CBT reduced, self-mutilation and expression of anger. A small ($n = 34$) randomized study in similar patients compared the ultra-short CBT (average of 2.7 sessions) with treatment as usual (TAU). This mini-intervention showed a decrease of suicidal attempts and self-mutilation in one-year follow up. Nevertheless, in a bigger study ($n = 480$), ultra-short manualized CBT in comparison with TAU moderately decreased self-mutilation but the result was not statistically significant [51]. In a recent randomized controlled trial with a longer CBT program (106 patients, average of 26 sessions) there was a significant decrease of suicidal and self-mutilation behavior, interpersonal aggressiveness, and improvement of global functioning in comparison with TAU in a two-year follow-up [52].

Dialectical Behavior Therapy Dialectical behavior therapy (DBT) was developed in response to the need for empirically supported psychotherapies for chronically suicidal individuals with BPD [53–58]. It consists of approximately 1 year of manual-guided therapy (involving 1 h of weekly individual therapy for 1 year and 2.5 h of group skills training per week for either 6 or 12 months). Linehan and colleagues [54] reported a randomized controlled trial of DBT involving patients with BPD whose symptoms included "parasuicidal" behavior. Control subjects in this study received "treatment as usual". Of the 44 study completers, 22 received DBT, and 22 received treatment as usual; patients were assessed at 4, 8, and 12 months. Patients who received DBT had less parasuicidal behavior, decrease of trait anger, reduced medical risk due to parasuicidal acts, fewer hospital admissions, fewer psychiatric hospital days, and a greater capacity to stay with the same therapist than did the control subjects. Because there were substantial dropout rates overall (30%) and the number of study completers in each group was small, it is unclear how generalizable these results are. Nonetheless, this study is a promising first report of a manualized regimen of CBT for a specific type of patient with BPD. One year after the termination of that study [54], the Linehan group reevaluated their patients [57]. The greater reduction in parasuicide rates and in severity of suicide attempts seen in the DBT group relative to the control subjects did not persist, although the reduction of psychiatric hospital days for the DBT group was still apparent. A second cohort of patients was subsequently studied with the same design [55]. In this report, there were 26 intent-to-treat patients (13 received DBT, and 13 received treatment as usual). Patients who received DBT had greater reductions in trait anger and greater improvement in Global Assessment Scale scores. DBT appears to be effective in treating the more serious behavioral aspects of BPD, namely suicidal behavior, self-mutilation and interpersonal aggression.

In a subsequent report, Linehan and colleagues [56] compared DBT with treatment as usual in drug-dependent patients with BPD. Only 18 of the 28 intent-to-treat patients completed the study (7 who received DBT and 11 given treatment as usual). Patients

receiving DBT had more drug- and alcohol-abstinent days after 4, 8, and 16 months. All patients had reduced parasuicidal behavior as well as state and trait anger; there was no difference between the groups on these variables. This study, too, involved small numbers of patients and had substantial dropout rates, but it represents an important attempt to evaluate the impact of DBT on severely ill patients with BPD and comorbid substance abuse.

Conclusion

Borderline personality disorder is characterized by instability and dysfunction in affective, behavioral, and interpersonal domains. Extreme affective instability frequently leads to impulsive and self-destructive behaviors. These episodes are usually brief and reactive and involve extreme alternations between angry and depressed states.

At present, treatment of BDP typically includes psychodynamic, cognitive behavioral, schema therapy, dialectic behavioral, group and pharmacological interventions. Most studies of psychotherapy are not specifically targeted to the impulsive and aggressive behaviors, but these domains were included among other measurements. The comparison between psychotherapeutic approaches in these domains has not yet been done.

Several studies indicate that many medications may diminish specific problems such as impulsivity, affective lability as well as irritability and aggressive behavior. Most recently studies have shown efficacy for atypical antipsychotic and anticonvulsants for anger and aggression. But there is still a lack of large, multicenter, double blind, placebo controlled studies in these indications. Current evidence supporting pharmacotherapy for BPD is modest at best [59, 60], and it must be remembered that no drug is licensed as a treatment specifically indicated for BPD [61]. Despite these limitations, conclusions can be drawn about pharmacotherapy for BPD patients with symptoms of impulsivity, irritability and aggressive behavior. Medication is mainly an adjunct to psychotherapeutic management.

The available studies indicate that medications are mildly to moderately effective for anger and impulsivity and modestly effective for control of aggressive behavior in BPD. Finally, a ood patient-therapist relationship will ensure that the patients are empowered to choose, use, and continue the medications that meet their personal needs and goals for the therapy.

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