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Psychosocial impairment in DSM-5 intermittent explosive disorder

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ABSTRACT

The purpose of this study was to document the functional severity of DSM-5 IED in a clinical research sample. IED and control groups were compared on psychosocial functioning, life satisfaction, and on a variety of cognitive and behavioral issues. IED study participants reported significantly worse psychosocial function, quality of life, and higher job dysfunction than both psychiatric and healthy control study participants. The presence of DSM-5 IED is associated with significant psychosocial and functional impairment. Early intervention may aid in minimizing the consequences of impulsive aggressive behavior, and improving psychosocial functioning and quality of life.

1. Introduction

Intermittent Explosive Disorder (IED) in DSM-5 is characterized by recurrent discrete episodes of aggressive impulsive behavior toward people or property. Throughout history, some version of IED has always been present in the Diagnostic and Statistical Manual (DSM), which reflects the importance of operationalizing a psychiatric diagnosis that features affective aggression as the core symptom. However, differences between the multiple iterations of IED from DSM-III to DSM-5 has limited both epidemiological and clinical research. A recent cross-national study of IED conducted through the World Mental Health Surveys initiative found lifetime prevalence of DSM-IV IED to range from 0.1 to 2.7% (n = 88,063) (Scott et al., 2016). The lifetime and past year prevalence estimates of narrowly defined DSM-IV IED (three or more high-severity episodes in a year) in the United States are 5.4% and 2.7%, respectively (Kessler et al., 2006; Coccaro, 2012).

The diagnostic criteria for IED in DSM-5 reflect several revisions to the DSM-IV criteria, and represent research criteria put forth previously (Coccaro et al., 1998; Coccaro 2011). Three revisions are particularly relevant to the current study. First, the nature and frequency of aggressive behavior required for diagnosis is significantly expanded, such that individuals engaging in high-frequency/low-intensity aggressive outbursts, including verbal aggression, may also be diagnosed with IED, in addition to the traditional low-frequency/high-intensity subgroup (American Psychiatric Association, 2013). Research suggests that the two groups, while different in their pattern of outbursts, do not differ on psychometric or analogue laboratory assessments of aggression (Coccaro, 2011; McCloskey et al., 2006). Second, the DSM-5 criteria specify that the aggressive behavior is not premeditated, i.e., is impulsive. Existing data point to significant differences between impulsive and premeditated aggression in environmental, pharmacological, and psychological treatment response factors (McCloskey et al., 2006) and may represent different brain responses to emotionally relevant stimuli (Coccaro et al., 2014). The addition of these criteria is expected to capture a wider contingency of individuals presenting with pathological aggression, while better operationalizing their aggressive behavior. Third, and perhaps most relevant to the current study, the diagnosis of IED now requires that individuals endorse subjective distress or social or occupational dysfunction associated with their aggression. Past research has indicated that IED is associated with significant biopsychosocial impairment. Compared with healthy controls, individuals with IED have a higher likelihood of developing a substance use disorder (Coccaro et al., 2016), frequent comorbidity with mood and anxiety disorders respectively (Kessler et al., 2006), and greater negative affective intensity and emotional lability causing distress (Fettich et al., 2015). IED is also associated with a broad range of adverse health outcomes (McCloskey et al., 2010) and when comorbid with a personality disorder is significantly associated with higher rates of non-suicidal self-injury (Jenkins et al., 2015). Finally, previous, modestly-sized, studies have suggested that individuals with IED, defined by Research Criteria, (Coccaro et al., 1998), exhibit greater overall impairment and poorer quality of life than psychiatric controls and healthy controls (Kulper et al., 2015; McCloskey et al., 2006), with individuals exhibiting both verbal and physical aggression significantly more impaired than individuals with physical aggression only or personality disordered individuals (Look et al., 2015).

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Ultimately, the inclusion of distress and/or functional impairment as a diagnostic criterion in DSM-5 lends the current research question increased salience, and highlights the importance of clarifying the nature of functional and psychosocial impairment among individuals with IED. Thus, the purpose of this study was to characterize the nature of occupational and interpersonal functioning, global psychosocial function, and life satisfaction among individuals with DSM-5 IED.

2. Method

2.1. Participants

Five-hundred-forty-one adult individuals participated in this study. All participants were physically healthy and were systematically evaluated in regard to aggressive and other behaviors as part of a larger program designed to study correlates of impulsive aggressive, and other personality-related, behaviors in human Participants. Participants were recruited through public service announcements, newspaper, and other media, advertisements seeking out individuals who: (a) reported psychosocial difficulty related to anger or, (b) had little evidence of psychopathology. All Participants gave informed consent and signed the informed consent document approved by our Institutional Review Board.

2.2. Assignment of diagnoses

Syndromal and personality disorder diagnoses were made according to DSM-5 criteria (American Psychiatric Association, 2013). Diagnoses were made using information from: (a) the Structured Clinical Interview for DSM Diagnoses (SCID-I; First et al., 1995) for syndromal (formally Axis I) disorders and the Structured Interview for the Diagnosis of Personality Disorder (Pfohl et al., 1997) for personality (formally Axis II) disorders; (b) clinical interview by a research psychiatrist; and, (c) review of all other available clinical data. Research diagnostic interviews were conducted by individuals with a masters, or doctorate, degree in Clinical Psychology. All diagnostic raters went through a rigorous training program that included lectures on DSM diagnoses and rating systems, videos of expert raters conducting SCID/SIDP interviews, and practice interviews and ratings until the rater were deemed reliable with the trainer. This process resulted in good to excellent inter-rater reliabilities (mean kappa of 0.84 ± 0.05; range: 0.79 to 0.93) across anxiety, mood, substance use, impulse control, and personality disorders. Final diagnoses were assigned by team best-estimate consensus procedures involving research psychiatrists and clinical psychologists (Coccaro et al., 2012). While information for assigning syndromal diagnoses were collected through the use of the SCID-I, more than sufficient information from was available to update syndromal diagnoses from DSM-IV to those of DSM-5; DSM-5 diagnoses for personality disorder, based on the SIDP, are the same for DSM-IV. Finally, participants with life history of bipolar disorder, schizophrenia (or other psychotic disorder), or mental retardation were excluded from study. This is because, by definition, IED participants cannot have such comorbidity. Participants with current substance use disorder were not included to be certain that impulsive aggressive behavior was not due to use of drugs of abuse.

After diagnostic assignment, 156 participants had no evidence of any psychiatric diagnosis (Healthy Controls: HC); 110 participants met criteria for a lifetime diagnosis of a syndromal psychiatric disorder or personality disorder (Psychiatric Controls: PC), and 275 participants met criteria for a current DSM-5 diagnosis of intermittent explosive disorder. Of the 385 PC/IED participants, most (79.5%) reported: a) history of formal psychiatric evaluation and/or treatment (60.8%) or, b) history of behavioral disturbance during which the subject, or others, thought they should have sought mental health services but did not (18.7%). Syndromal and personality disorder diagnoses are listed in Table 1.

Table 1
Syndromal and personality disorder diagnoses of study participants.

	PC (N = 110)	IED (N = 275)	P
Current syndromal disorders:			
Any depressive disorder	13 (11.8%)	41 (14.9%)	= 0.517
Any anxiety disorder	19 (17.3%)	60 (21.8%)	= 0.402
Stress and trauma disorders	7 (6.4%)	42 (15.3%)	= 0.018
Obsessive–compulsive disorders	1 (0.9%)	9 (3.3%)	= 0.293
Eating disorders	5 (4.5%)	14 (5.1%)	= 0.999
Somatoform disorders	1 (0.9%)	4 (1.5%)	= 0.999
Non-IED impulse control disorders	0 (0.0%)	4 (1.5%)	= 0.582
Lifetime syndromal disorders:			
Any depressive disorder	49 (44.5%)	155 (56.4%)	= 0.046
Any anxiety disorder	25 (22.7%)	76 (27.6%)	= 0.370
Any substance use disorder	49 (44.5%)	136 (49.5%)	= 0.430
Stress and trauma disorders	16 (14.6%)	74 (26.9%)	= 0.011
Obsessive–compulsive disorders	4 (3.6%)	12 (4.4%)	= 0.999
Eating disorders	8 (7.3%)	31 (11.3%)	= 0.268
Somatoform disorders	1 (0.9%)	4 (1.5%)	= 0.999
Non-IED impulse control disorders	0 (0.0%)	8 (2.9%)	= 0.112
Personality disorders:			
Cluster A (Odd)	6 (5.5%)	38 (13.8%)	= 0.021
Cluster B (Dramatic)	25 (22.7%)	122 (44.4%)	< 0.001*
Cluster C (Anxious)	22 (20.0%)	61 (22.2%)	= 0.683
PD-NOS	26 (23.6%)	93 (33.8%)	= 0.052

* $p < 0.05$ after correcting for multiple comparisons.

2.3. Assessment of global psychosocial function and life satisfaction

Global psychosocial function was assessed during the diagnostic ratings evaluation using the Global Assessment of Function (GAF; Jones et al., 1995) scale and was assessed by the diagnostic interviewers referred to above. For purposes of illustration, a GAF score in the range of 81–90 (e.g., HC participants) describes an individual with “absent or minimal symptoms, good functioning in all areas, interested and involved in a wide range of activities, socially effective, generally satisfied with life, with no more than everyday problems or concerns”; a GAF score in the range of 61–70 (e.g., PC participants) describes an individual with “some mild OR some difficulty in social, occupational, but generally functioning pretty well, has some meaningful interpersonal relationships”; a GAF score in the range of 51–60 (e.g., IED participants) describes an individual with “moderate symptoms OR moderate difficulty in social, occupational, or school functioning”. Life experience and satisfaction was assessed using the sixteen-item Quality of Life Experience and Satisfaction Questionnaire (Q-LES-Q; Endicott et al., 1993). The items on the Q-LES-Q are rated on 0 to 4 Likert scale (0 = very poor” to 4 = “very good”). The items inquire about how satisfied the respondent feels about their experience and satisfaction with physical health, mood, work, family and social relationships. For purposes of illustration, a Q-LES-Q score of about 52 (e.g., HC Participants) describes an individual with “good to very good” life satisfaction, a score of about 45 (e.g., PC participants) describes an individual with “fair to good” life satisfaction, and a score of about 38 describes an individual with “fair” life satisfaction (e.g. IED participants).

2.4. Assessment of occupational and interpersonal function in adulthood

Occupational function was assessed during the diagnostic ratings evaluation by interview of participants regarding current employment, number of times unemployed, and number of times fired from a job. Interpersonal function was assessed by current marital status, number of times married, and number of times divorced.

2.5. Assessment of aggression, impulsivity, and related behaviors

Aggression was assessed with the Aggression score from the Life History of Aggression (LHA) assessment and Aggression (Physical and

Table 2
Demographic and psychometric characteristics of study participants.

	HC	PC	IED	*p*	Group differences
Demographic variables					
Age	31.8 ± 9.2	33.4 ± 9.2	35.7 ± 10.3	< 0.001[a]	IED > HC; IED > PC; PC > HC
Gender (% Male)	49.4%	50.9%	46.5%[b]	= 0.702[b]	IED = PC = HC
Race (% Non-White)	42.9%	46.4%	57.8%	= 0.006[b]	IED > HC; IED > PC; PC = HC
SES score	43.5 ± 12.2	38.5 ± 15.3	38.6 ± 13.7	= 0.001[a]	IED < HC; IED = PC; PC < HC
Psychometric variables					
LHA aggression	4.9 ± 3.3	8.2 ± 5.2	18.6 ± 4.0	< 0.001	IED > PC > HC
BPA aggression	28.1 ± 9.6	32.9 ± 10.2	47.8 ± 11.8	< 0.001	IED > PC > HC

Verbal) score from the Buss-Perry Aggression questionnaire (BPA; Buss and Perry 1992). The LHA assesses history of actual aggressive behavior and BPA assesses aggressive tendencies as a personality trait.

2.6. Statistical analysis

Comparisons of between-group variables were performed by Chi-square, analysis of variance/covariance (ANOVA/ANCOVA; MANOVA/MANCOVA) followed by Tukey HSD post-hoc testing. Other analyses involved binary logistic regression with relevant covariates as necessary. A two-tailed alpha value of 0.05 was used to denote statistical significance for all analyses.

3. Results

3.1. Sample characteristics

Sample characteristics are presented in Table 2. The three groups differed modestly, but significantly, in age, socioeconomic score, and non-white ethnicity. Accordingly, subsequent analyses controlled for these demographic differences where necessary. IED and PC groups did not differ in rates of psychiatric comorbidity except for in lifetime trauma and stress disorders and in the presence of cluster B (dramatic) personality disorders (Table 3). Finally, as expected, the groups differed in scores on the aggression variables.

3.2. IED and interpersonal function in adulthood

MANCOVA of GAF and Q-LES-Q scores revealed that both variables were significantly lower among IED participants, compared with PC participants, who had significantly lower GAF scores compared with HC participants (Fig. 1, left). Not surprisingly, GAF scores correlated highly with Q-LES-Q scores (partial $r = 0.55$, $p < 0.001$). Subsequent ANCOVA, with GAF scores as an additional covariate, revealed that Q-LES-Q scores were significantly lower among IED participants compared to both PC and HC participants who did not differ in Q-LES-Q scores (Fig. 1, right). These results were not changed after adding lifetime Trauma and Stress Disorders and Cluster B Personality Disorders to the statistical models ($F[2,531] = 4.82$, $p = 0.008$).

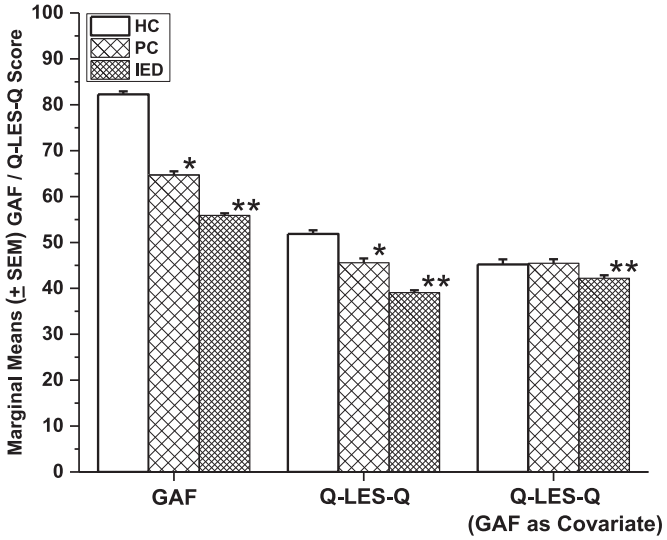

Fig. 1. Comparison of GAF and Q-LES-Q across IED, PC, and HC participants.

At time of study entry, IED participants differed from HC and PC participants regarding living alone (IED < HC/PC) and for being never married (IED < HC/PC); Table 3. While the three groups were similar in marital status at study entry, both IED and PC participants were more likely than HC participants to be divorced or separated at time of study entry. Despite this, IED and PC participants had a larger mean number of both marriages and divorces compared with HC participants. Further analysis ($X^2 = 20.04$, df = 4, $p < 0.001$) revealed that IED and PC participants were more likely than HC participants to have been

Table 3
Interpersonal function in HC, PC, and IED study participants.

Functional areas	HC	PC	IED	Group differences
Interpersonal function				
Currently lives alone[a]	43 (27.9%)	30 (29.1%)	55 (20.1%)	HC > IED: OR: 1.84 (1.11–2.94), $p = 0.017$ PC > IED; OR: 1.79 (1.04–3.08), $p = 0.036$ PC = HC; OR: 1.03 (0.58–1.81), $p = 0.923$
Currently single/never married[a]	118 (75.6%)	74 (67.3%)	157 (57.1%)	HC > IED; OR: 2.05 (1.24–3.39), $p = 0.005$ PC > IED; OR: 1.33 (0.78–2.28), $p = 0.293$ HC = PC; OR: 1.47 (0.80–2.71), $p = 0.216$
Currently married/widowed[a]	29 (18.6%)	16 (14.5%)	65 (23.6%)	HC = PC = IED
Currently divorced/ separated[a]	9 (5.8%)	20 (18.2%)	53 (19.3%)	IED > HC; OR: 2.82 (1.29–6.21), $p = 0.010$ IED = PC; OR: 0.80 (0.42–1.51), $p = 0.487$ PC > HC: OR: 4.26 (1.64–11.11), $p = 0.003$
Number of marriages[b]	0.32 ± 0.05	0.42 ± 0.05	0.51 ± 0.03	IED = PC > HC: F [2,534] = 5.49, $p < 0.01$
Number of divorces[b]	0.10 ± 0.04	0.23 ± 0.04	0.23 ± 0.03	IED = PC > HC: F [2,534] = 3.57, $p = 0.059$

[a] Binary logistic regression with demographic variables as covariates.
[b] Marginal means (± SEM) after ANCOVA with demographic variables as covariates.

Table 4
Occupational function in HC, PC, and IED participants.

Functional areas	HC	PC	IED	Group differences
Occupational function				
Currently unemployed[a]	22 (14.1%)	32 (29.1%)	73 (26.5%)	HC = PC = IED
Number of times unemployed[b]	0.93 ± 0.19	0.96 ± 0.22	1.57 ± 0.14	IED > HC, IED > PC, PC = HC F [2,534] = 5.00, $p = 0.007$
Number of times fired from job[b]	0.27 ± 0.20	0.81 ± 0.24	1.16 ± 0.15	IED > HC, PC = HC, IED = PC F [2,534] = 6.06, $p = 0.003$
Fired due to aggressive behavior[a]	4 (2.6%)	7 (6.4%)	48 (17.5%)	IED > HC; OR: 6.71 (2.34–19.23), $p < 0.001$ IED > PC; OR: 2.98 (1.28–6.90), $p = 0.011$ PC = HC; OR: 2.22 (0.61–8.13), $p = 0.226$

[a] Binary logistic regression with demographic variables as covariates.
[b] Marginal means (± SEM) after ANCOVA with demographic variables as covariates.

divorced two times, while IED participants were more likely to have been divorced three or more times compared with both HC and PC participants.

IED and PC participants were more likely to be unemployed at time of study entry compared with HC participants; Table 4. Further analysis revealed that IED, compared with HC, participants to have been unemployed twice (z = 2.28), and three or more times (z = 3.70); IED participants were also more likely than PC participants to have been unemployed three or more times (z = 2.23). IED participants were more likely than HC participants to have been fired from a job; PC and HC participants did not differ in this comparison. Finally, IED participants were more likely than HC or PC participants to have been fired from a job because of aggressive behavior.

4. Discussion

The primary finding in this analysis is that current IED, a categorical expression of impulsive aggression, is associated with significant psychosocial impairment and disability. The findings support the revisions to IED criteria in DSM-5, which require that the pattern of impulsive aggression be associated with significant distress or functional impairment. Functional impairment associated with IED was observed in this clinical research sample which included both HC and PC controls as comparison groups. Compared with HC controls, IED participants reported more distress and impairment in nearly all domains assessed. This may have been due to the non-aggressive psychopathology shared by IED and PC control participants. However, since IED and PC participants had similar rates of syndromal and personality disorders, differences between these IED and PC groups would indicate a difference due to the presence of IED. That said, IED participants had significantly worse global function compared with PC participants and significantly worse quality of life experience and satisfaction, even after controlling for global function. This finding highlights that, in addition to the interpersonal challenges associated with IED cited in previous literature and in the current study, individuals with IED also experience significant intrapersonal distress. Thus, in treating individuals with IED, ratings of quality of life and satisfaction with life experience could be considered a marker of improvement (e.g., IED participants also differed from PC participants in being unemployed on at least three or more occasions, in being fired for aggressive behavior, and in being divorced at least three or more times).

This study has several strengths and limitations. Its greatest strength is a relatively large sample that used state of the art assessment tools blind to our hypotheses. Updating psychiatric diagnoses to meet DSM-5 criteria makes these data currently useful to researchers and clinicians alike. Limitations include the cross-sectional nature of this study, the exclusion of persons with bipolar disorder in the clinical research sample, and that the clinical research participants were not recruited from treatment facilities. First, as a cross-sectional study, the reported associations cannot be translated into causation. Second, bipolar disorder was excluded because the aim of the overall study was to investigate impulsive aggression in the absence of various factors (e.g., bipolar mood disorder, psychosis, etc.) that could affect aggression. Finally, while the psychiatric Participants in this study were not primarily recruited from treatment settings, 79.5% had history of formal treatment for psychiatric disorder (60.8%) or of behavioral disturbance that should have been assessed by mental health professionals (18.7%). Accordingly, most of the psychiatric study participants should be similar to those drawn from a treatment setting.

5. Conclusions

Despite the fact that IED is a relatively common condition, is associated with important consequences of aggressive behavior, including significant impairment in social and occupational domains, IED continues to garner limited attention in the literature. As noted in this report, individuals with DSM-5 IED also suffer with a significant reduction in quality of life experience and satisfaction as compared to both psychiatric and health controls, even after controlling for global assessment of functioning. IED warrants heightened consideration in both research and clinical settings, with the aim of developing interventions that improve functioning and quality of life.

Role of funding sources

Funding sources has no role in study design or in the collection, analysis and interpretation of data or in the writing of this report.

Conflicts of interest

Dr. Coccaro reports being a consultant to and being on the Scientific Advisory Boards of Azevan Pharmaceuticals, Inc. and of Avanir Pharmaceuticals, Inc., and being a current recipient of a grant award from the NIMH. Dr. Rynar reports no conflicts of interest regarding this work.

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Supplementary materials

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