Lifetime and 1-Month Prevalence Rates of Intermittent Explosive Disorder in a Community Sample

Emil F. Coccaro, M.D.; Catherine A. Schmidt, Ph.D.; Jack F. Samuels, Ph.D.; and Gerald Nestadt, M.D.

Received Oct. 24, 2003; accepted Jan. 5, 2004. From the Clinical Neuroscience and Psychopharmacology Research Unit, Department of Psychiatry, The Pritzker School of Medicine, University of Chicago, Chicago, Ill. (Drs. Coccaro and Schmidt) and the Department of Psychiatry, Johns Hopkins School of Medicine, Baltimore, Md. (Drs. Samuels and Nestadt).

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Corresponding author and reprints: Emil F. Coccaro, M.D., Department of Psychiatry, MC #3077, The University of Chicago, 5841 South Maryland Ave., Chicago, IL 60637 (e-mail: ecoccaro@yoda.bsd.uchicago.edu).

Objective: To determine the lifetime and 1-month prevalence of intermittent explosive disorder (IED) by both DSM-IV and research criteria in a community sample.

Method: The final 253 (34.1%) of individuals who were entered into the Hopkins Epidemiology Study of Personality Disorder and sampled in the context of a follow-up study of participants from the Baltimore Epidemiologic Catchment Area (ECA) study completed a supplemental interview that allowed for the determination of IED by DSM-IV and/or research criteria.

Results: The mean ± SE percentage of subjects who met inclusion criteria was 11.07% ± 1.97%, and 6.32% ± 1.53% met full criteria, for lifetime IED by either diagnostic criteria set; 2.37% ± 0.96% met full criteria for IED within the previous 1 month. Adjusting the prevalence rates to account for differential sampling from the original ECA study did not substantially affect these results. Onset of problematic aggressive behavior in IED subjects (described as lifelong in most subjects) began as early as childhood, peaked in the third decade, and declined steadily after the fifth decade. While distress and/or impairment due to aggressive behavior was documented in 87.5% of IED subjects, only 12.5% of IED subjects reported seeking help for this problem.

Conclusions: Intermittent problematic aggressive behavior in the community, as defined by IED, may be far more common than previously thought. Conservatively estimated, the number of individuals in the United States with IED, based on these data, may be no lower than 1.4 million for current IED or nearly 10 million for lifetime IED.

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Intermittent explosive disorder (IED) is characterized by recurrent episodes of aggressive behavior that is out of proportion to psychosocial stressors and/or provocation and that is not better accounted for by another mental disorder, comorbid medical conditions, or the physiologic effects of a pharmacologic agent or other substance with psychotropic properties.[1] Despite its inclusion in the DSM for more than 2 decades, there are few data regarding the prevalence or lifetime rates of IED in either psychiatric or community settings. Available data from clinical surveys of samples of psychiatric inpatients[2] and clinical treatment studies of IED[3] suggest that rates of IED in psychiatric settings range from 1% to 2%. Given that clinical settings are enriched with psychopathology compared with community settings, these data are consistent with the idea, expressed in the DSM-IV,[(p611)] that IED is "apparently rare" in the community. These estimates, however, do not take into account changes in the diagnostic criteria of IED from DSM-III[4] to DSM-IV[1] or changes, as recently proposed, in the development of research criteria for IED.[5,6] For example, DSM-IV criteria (and research criteria) for IED no longer include the exclusionary criterion that subjects must not display generalized aggression or impulsivity in between seriously aggressive episodes. Given that this criterion alone eliminated 80% of subjects with clinically significant histories of impulsive aggressive behavior from an IED diagnosis in at least 1 study,[3] it is likely that the early studies suggesting very

Table 1. DSM-IV and Research Criteria for Intermittent Explosive Disorder

DSM-IV Criteria[a]
- Several discrete episodes of failure to resist aggressive impulses that result in serious assaultive acts or destruction of property
- The degree of aggressiveness expressed during the episodes is grossly out of proportion to any precipitating psychosocial stressors
- The aggressive behavior is not better accounted for by another mental disorder (eg, antisocial or borderline personality disorder, a psychotic disorder, a manic episode, conduct disorder, or attention-deficit/hyperactivity disorder) and is not due to the direct physiologic effects of a substance (eg, a drug of abuse, a medication) or a general medical condition (eg, head trauma, Alzheimer's disease)

Research Criteria[b]
- Recurrent incidents of aggression manifest as either of the following:
  - Verbal or physical aggression toward other people, animals, or property occurring twice weekly, on average, for 1 month **or** 3 episodes involving physical assault against other people or destruction of property over a 1-year period
- The degree of aggressiveness expressed during the episodes is grossly out of proportion to the provocation or to any precipitating psychosocial stressors
- The aggressive behavior is generally not premeditated (ie, is impulsive) **and** is not committed in order to achieve some tangible objective (eg, money, power, intimidation)
- The aggressive behavior causes either marked distress in the individual or impairment in occupational or interpersonal functioning
- The aggressive behavior is not better accounted for by another mental disorder (eg, major depressive/manic/psychotic/attention-deficit hyperactivity disorder) or the direct physiologic effects of a substance (eg, a drug of abuse, a medication) or a general medical condition (eg, head trauma, Alzheimer's disease)

[a]Based on *Diagnostic and Statistical Manual of Mental Disorders*, Fourth Edition.[1]
[b]Based on Coccaro.[9]

low rates of IED substantially underestimate the rate of IED.

In the current study, we present pilot data from a community sample suggesting that lifetime prevalence rates of IED in the community range from 3.32% to 9.32% and that 1-month rates range from 0.49% to 4.25%. If these rates are valid, IED may be far more prevalent than previously thought.

METHOD

Sample

Subjects participating in this pilot community survey of IED were studied in the context of the Hopkins Epidemiology Study of Personality Disorder (HESPD) sampled from the Baltimore Epidemiologic Catchment Area Follow-Up survey.[7] The parent sample, described in detail by Samuels et al.,[8] was composed of 742 subjects participating in a series of interviews and questionnaires aimed at the study of the epidemiology of personality disorder in the community. The subjects in this report represent the final 253 consecutive subjects interviewed in the HESPD study.

Assessments

Data regarding features of IED were obtained by interview, using a structured interview form developed by one of the authors (E.F.C.) that collected information necessary to make a diagnosis of IED by either DSM-IV or research diagnostic criteria (Table 1).[9] The IED module was composed of gate and follow-up questions regarding anger and the frequency of temper tantrums, verbal arguments and outbursts, destruction of property, and physical assault of (and injury to) others. Subsequent questions were asked to determine whether aggressive outbursts were (1) out of proportion to provocation, (2) primarily impulsive in nature, (3) associated with distress in the individual (or impairment in work or psychosocial function), and (4) exclusively associated with drug or alcohol intoxication.

Other data relevant to the diagnosis of IED were available from the parent study, which included demographic data as well as data regarding Axis I and Axis II diagnoses of the subjects in the parent sample. Axis I diagnoses had previously been made by Diagnostic Interview Schedule,[7] and Axis II diagnoses were made based on data collected by use of the International Personality Disorder Examination.[10] The Axis II and IED assessments were conducted by 4 masters-level clinical psychologists.[8] After the interviews, the psychologists formulated a final rating for each criterion on the basis of their clinical judgment of both subject and informant reports, as available, and completed a case summary of each subject.

Statistical Analysis

Diagnoses of IED were generated by algorithms based on the interview data and DSM-IV and research criteria sets. Where information relevant to any 1 criterion for IED was missing, no diagnosis of IED was made depending on the IED criteria set used (i.e., 4 "non-cases" for DSM-IV and 7 "non-cases" for IED-Integrated Research [IR]). Two of the authors (E.F.C. and C.A.S.) independently applied these algorithms to make the 2 types of IED diagnoses. Interrater reliability for IED was excellent by either criteria set (kappa: DSM-IV = .83, research = .86, either set = .89; all p values < .001). Then, using other data from the parent HESPD study, a final diagnosis was made by best estimate (E.F.C. and C.A.S.), excluding anyone with a life history of psychotic or bipolar disorder from an IED diagnosis (both criteria sets) or, for a DSM-IV IED diagnosis, anyone meeting DSM-IV criteria for antisocial or borderline personality

disorder. In order to account for unequal selection probabilities in the sample,[8] weights were also used to calculate a prevalence estimate that would control for the fact that the HESPD sample was selected to have a prevalence of Axis I disorders higher than that in the general population.[8] Accordingly, it is possible that analysis of the raw data alone could yield inflated estimates of the prevalence of IED because IED is frequently comorbid with other Axis I disorders[5] that are, in turn, more prevalent in this sample than in the general population. However, since weighted estimates were about 20% higher than unweighted estimates (and the 95% confidence intervals of both estimates overlapped), unweighted estimates are presented below as conservative estimates of the prevalence of IED based on this sample.

RESULTS

The demographic characteristics of this sample did not differ from the sample from which it was drawn[8]; the subjects in this sample were middle aged (mean = 50.4 ± 11.9 years), primarily female (63.6%), white (60.7%), and married or living with a mate (50.6%).

Lifetime and 1-Month Prevalence Rates of IED

Overall, 28 (11.07%) of 253 subjects met inclusion criteria for lifetime IED by either DSM-IV or research criteria. Of the total sample, 12 (4.74%) did not meet exclusion criteria for IED and could not be counted as meeting full diagnostic criteria for IED by either diagnostic criteria set: 7 because IED occurred only in the context of alcohol/drug intoxication, 2 because of a bipolar diagnosis, 2 because diagnostic exclusionary criteria could not be ruled out, and 1 because of comorbid antisocial personality disorder in a subject that did not meet full research criteria for IED (which does not exclude the presence of antisocial personality disorder). Of those who met both inclusion and exclusion criteria for lifetime IED by either diagnostic criteria set (16 of 253: 6.32%), 3 did so by DSM-IV criteria only (1.19%), 6 by research criteria only (2.37%), and 7 by both DSM-IV and research criteria (2.77%). Considering prevalence rates by one criteria set or the other, 10 (3.95%) met lifetime IED by DSM-IV and 13 (5.14%) by research criteria.

Of these 16 subjects, nearly all (14 of 253: 5.53%) reported engaging in either physical assault on persons (3.16%) or objects (2.37%) during an aggressive episode; the remaining 2 subjects (0.79%) reported very frequent (at least twice weekly) verbal assault during aggressive episodes that was associated with impairment and/or distress (i.e., IED by research criteria). Among those subjects meeting IED by either diagnostic criteria set, only 3 of 16 (18.75%) also met DSM-IV criteria for either antisocial or borderline personality disorder, a rate not different from that observed among subjects meeting criteria for antisocial or borderline personality disorder in general (3 of 13: 23.08%). Table 2 summarizes unweighted estimates for both the lifetime and 1-month rates (mean ± SE) for all IED by inclusion criteria, IED by DSM-IV criteria, IED by research criteria, and IED by either DSM-IV or research criteria. Overall, 1-month prevalence rates were about 40% of lifetime prevalence rates.

Table 2. Lifetime and 1-Month Prevalence Rates of Intermittent Explosive Disorder (IED) in the 253 Subjects

Type of IED	N	Lifetime Estimate, % (mean ± SE)	1-Month Estimate, % (mean ± SE)
All IED by inclusion criteria	28	11.07 ± 1.97	3.16 ± 1.10
DSM-IV IED	10	3.95 ± 1.22	1.58 ± 0.78
IED-IR	13	5.14 ± 1.39	1.98 ± 0.88
Either DSM-IV IED or IED-IR	16	6.32 ± 1.53	2.37 ± 0.96

Abbreviation: IR = integrated research.

Demographic and Comorbidity Patterns

While IED subjects by either criteria set did not differ significantly from remaining subjects by age, gender, race, or marital status, there were statistically nonsignificant gender/racial differences among IED subjects, whereby IED subjects appeared less likely to be male or white (6 of 16 in both cases: 37.5%). Comorbidity patterns of IED subjects by either diagnostic criteria set were similar to those of the rest of the sample. However, although not reaching statistical significance, IED subjects tended to have a greater frequency of social phobia (31.3% vs. 9.0%) and alcohol dependence or abuse (43.8% vs. 23.4%) compared with non-IED subjects.

Age at Onset and Duration of IED

Within the IED subject group (by either criteria set), the mean age at onset of aggressive behavior was 18.3 ± 7.2 years, and periods of aggressive behavior were reported to be lifelong in most subjects (75%) and did not differ as a function of gender (males: 18.5 ± 8.7 years; females: 18.1 ± 7.0 years). Aggressive behavior was reported to occur in nearly all decades of life beginning in the first decade, peaking in the third decade, diminishing steadily after the fifth decade, and culminating in no reported aggression by the eighth decade. The proportion of IED subjects reporting aggressive behavior in each decade of life was as follows: first decade, 18.8%; second decade, 56.3%; third decade, 87.5%; fourth decade, 75.0%; fifth decade, 43.8%; sixth decade, 18.8%; seventh decade, 6.3%; and eighth decade, 0%.

Functional Impairment or Distress and Treatment Seeking of IED Subjects

IED subjects (by either criteria set) reported significant psychosocial impairment (81.3%) or personal distress

(50.0%) associated with their aggressive behavior. Impairment was reported in association with aggression-related problems in relationships in 62.5% of subjects (with family: 56.3%, with friends: 12.5%, at work: 18.8%) or aggression-related problems with the law (50.0%). Together, psychosocial impairment and distress were reported by all but 2 IED subjects (87.5%) (since data regarding distress or impairment were missing in these 2 subjects, only an IED diagnosis by DSM-IV could be assigned). Nonetheless, only 2 IED subjects (12.5%) reported seeking help for their aggressive behavior, both due to problems with the law.

DISCUSSION

This pilot study of lifetime and 1-month rates of IED in a community sample reveals that problematic aggressive behavior, as a diagnostic entity, is far more prevalent than was previously appreciated. Lifetime rates of behaviors characteristic of IED were present in about 11.1% of the sample and 1-month rates in about 3.2% of the sample. While up to 43% of these subjects did not fulfill the exclusion criteria for IED by either DSM-IV or research criteria, 6.3% of subjects met 1 criteria set for IED lifetime, and about 2.4% of subjects met 1 criteria set for IED in the past month. This rate is notably more than the 1% to 2% rates suggested by previously published reports[2,3] and certainly far more than "rare," as suggested by DSM-IV.[1]

The differences in rates between this report and reports of years past are most likely due to changes in diagnostic criteria for IED from DSM-III/III-R to DSM-IV and research criteria. Most important, in this regard, is the deletion of the generalized impulsivity/aggressiveness exclusion criterion in DSM-III/III-R that alone greatly increases the number of subjects who could be given a DSM diagnosis of IED.[3] Given a current U.S. population of approximately 280 million people, and mindful of the 95% confidence intervals about these estimates, these data suggest that IED (lifetime) may be present in nearly 9.3 (i.e., $3.32\% \times 280$) to 26.1 (i.e., $9.32\% \times 280$) million individuals and in nearly 1.4 (i.e., $0.49\% \times 280$) to 11.9 (i.e., $4.25\% \times 280$) million individuals in any given month in the United States. Data collected from much larger community samples, of course, will be needed to confirm and narrow the range of these estimates.

While this study used 2 diagnostic criteria sets for IED, it is important to note that nearly half of the IED subjects met both diagnostic criteria sets and that nearly as many met the research criteria for IED (if not the DSM-IV criteria as well). Less than 20% of subjects met only the DSM-IV criteria set for IED. Compared with DSM-IV criteria, research criteria for IED allow frequent, though less severe, aggressive behaviors but require aggressive behavior to be impulsive in nature and require that distress or impairment due to the aggressive behavior be present. In addition, research criteria explicitly allow comorbid diagnoses of either antisocial or borderline personality disorder. Despite these differences, it should be noted that 2 of the 3 subjects in the "DSM-IV Only IED" group missed meeting the research criteria, as well, only because evidence (or absence) of impairment was not documented during the interviews. If evidence of impairment had been documented in these 2 subjects, only 1 subject (6% of the total IED group) would remain as diagnosed by DSM-IV criteria only. Regardless of which criteria set was used, lifetime and 1-month rates of IED remained higher than expected given previous reports.

The IED subjects in this sample did not demonstrate any significant differences in demographic characteristics or patterns of comorbidity. However, the number of IED subjects was small, and evaluation of the differences observed between IED and non-IED subjects in lifetime rates of alcohol use disorder, or in social phobia, will require a much larger data set. While it is notable that less than 20% of IED subjects had comorbid antisocial or borderline personality disorder, it is more notable that less than 25% of antisocial or borderline personality disorder subjects met either criteria set for IED. While a large number of antisocial or borderline personality disorder individuals in clinical samples have been reported to have IED,[5] IED may not be as common in these subjects as previously thought. If so, there may be little rationale to consider antisocial or borderline personality disorder as an exclusion for IED as it currently appears in the DSM-IV criteria set.

In this sample, IED subjects reported a relatively early age at onset of problematic aggressive behavior (mean age at onset was in the second decade), as well as a history of persistent problematic aggressive behavior that followed temporal patterns generally expected for aggression (i.e., peaking in the third decade, continuing in the fourth decade, then declining steadily after that until old age) but not previously documented for subjects with IED. The age at onset reported for this sample is consistent with that reported previously and did not differ as a function of gender.[11]

The gender ratio for IED of about 6 males to 10 females (i.e., 37.5% male) is at variance with previous literature that reports much higher male-to-female ratios (typically in the range of 3 males to every female[5,11,12]). It is noteworthy, however, that most subjects in the sample were female and that there was no difference in the proportion of males to females as a function of IED or non-IED status. Given the variability in measures of aggression as a function of gender (for which studies suggest either a greater degree of aggression in males compared with females[13] or no difference in aggression across gender[14]), it may not be surprising to observe a higher rate of IED among females than previously thought. Further investigation with larger samples of IED subjects will be

necessary to determine the true gender ratio in IED. The racial ratio of 6 white to 10 non-white subjects with IED (i.e., 37.5% white) is also at variance with the literature at this time.[5,11] However, the number of subjects with IED in this sample was small, and further investigation will be necessary to determine if ethnic differences in the prevalence of IED exist.

As stated above, an important aspect of the research criteria is the presence of distress or impairment associated with aggressive behavior. In this sample, nearly all subjects reported either subjective distress or impairment in psychosocial function (no data were available to rule in or rule out impairment in 2 of the subjects). However, less than 15% of IED subjects reported seeking treatment for their problematic aggressive behavior, and these subjects did so in response to related problems with the law.

These data, while limited, suggest that the vast majority of individuals in the community do not see problematic aggressive behavior as something to "treat" on its own. This probably reflects at least 2 factors. First is the lack of public awareness that problematic aggression could constitute a diagnostic entity that is amenable to treatment; note that none of the IED subjects who reported distress at their own problematic aggressive behavior sought treatment for this problem. Second is that a substantial number of individuals are not distressed enough to seek treatment even if it were available; note that half of the IED subjects did not report subjective distress associated with their problematic aggressive behavior. For the 2 subjects reporting treatment for problematic IED, neither reported subjective distress, but both reported that problems with the law were associated with treatment seeking.

Seeking treatment due to problems with the law represents a very high threshold for treatment. Accordingly, it is unlikely that the vast majority of subjects with IED will seek treatment in the absence of further public awareness about this disorder. Moreover, these data suggest a very large underserved population of individuals with problematic aggression. Even if only IED subjects who recognize their own distress at their aggressive behavior (50% of this sample of IED subjects) are considered, a considerable number of individuals in the United States would be potentially interested in treatment for their intermittent, problematic, aggressive behavior. Based on these data, there could be, in any given month, from 700,000 to nearly 6 million individuals with IED interested in treatment for this behavioral disorder. These figures are in the range seen for other major psychiatric disorders and, if true, indicate that further clinical assessment and treatment of IED are warranted.

Disclosure of off-label usage: The authors have determined that, to the best of their knowledge, no investigational information about pharmaceutical agents has been presented in this article that is outside U.S. Food and Drug Administration–approved labeling.

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