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Intermittent explosive disorder and other psychiatric co-morbidity among court-referred and self-referred aggressive drivers

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Abstract

We assessed possible Axis I and Axis II disorders in two groups of aggressive drivers (n=20, court-referred; n=10, self-referred) and 30 non-aggressive driver controls, using the SCID and SCID-II. Aggressive drivers were more likely than controls to be positive for any Axis I and Axis II disorders. They were also more likely to meet the criteria for Intermittent Explosive Disorder (IED), current or past alcohol or substance abuse or dependence and Antisocial PD and Borderline PD. The self-referred aggressive drivers were more likely than court-referred aggressive drivers to meet the criteria for a current or past Anxiety Disorder. Re-analysis of aggressive driver data on the basis of presence or absence of IED revealed differences only in Axis II disorders: those with IED were more likely to meet the criteria for any Axis II disorder and Antisocial PD.

Keywords: Intermittent Explosive Disorder; Aggression; Anger; Aggressive driving

1. Introduction

Aggressive driving, and its more severe form popularly known as “road rage”, have recently attracted notable public attention. For example, traffic safety officials have noted that aggressive driving is on a par with DWI/DUI as a risk factor for motor vehicle accidents (MVAs). Martinez (1997) estimated that one-third of all personal injury MVAs and two-thirds of MVA fatalities

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were due to aggressive driving. Snyder (1997) estimated that 50% of all MVA crashes involved aggressive driving.

Just who the aggressive driver is, has only recently attracted the attention of psychology and psychiatry. For example, Larson (1996) has described a typology of aggressive drivers in his book, *Steering Clear of Highway Madness*. He has also described a questionnaire, *The Driver's Stress Profile*, to identify these individuals and measure improvement from treatment.

Deffenbacher and colleagues (Deffenbacher, Oetting, & Lynch, 1994) have developed a measure to identify potential aggressive drivers, the *Driving Anger Scale*, and have shown that college students in the upper quartile of this scale improve with psychological treatments (Deffenbacher, Huff, Lynch, Oetting, & Salvatore, 2000). Those high in driving anger also tended to have relatively elevated scores on several well-known psychological tests such as trait anger (Spielberger, 1988) and trait anxiety (Spielberger, 1983).

Neither of these two research teams has directly addressed the issue of whether aggressive drivers have diagnosable psychopathology. Larson hints that part of his population of self-referred aggressive drivers were high in Type A, Coronary Prone Behavior, but this is not a diagnosable condition.

One potential diagnosis which comes to mind for this population is Intermittent Explosive Disorder (IED), described by DSM-IV (APA, 1994) as one of the impulse control disorders whose essential feature is, "the occurrence of discrete episodes of failure to resist aggressive impulses in serious assaultive acts or destruction of property" (p. 609). IED is itself an under-studied condition (McElroy, 1999; Monopolis & Lion, 1983; Felthous, Bryant, Wingerter, & Barratt, 1991). McElroy, Soutullo, Beckman, Taylor and Keck (1998) assessed 27 individuals with potential IED using the SCID (Structured Clinical Interview for DSM-IV (First, Spitzer, Gibbon, Williams, & Benjamin, 1996a, 1996b)). They found a high level of mood disorders; specifically 89% met the criteria for a current mood disorder while 93% with lifetime mood disorders. They also found 37% with current anxiety disorder and 48% with lifetime anxiety disorder and 48% with lifetime alcohol or substance abuse. The authors speculated that IED might belong in the affective spectrum. This excellent study suffers from at least two deficits: no control population was studied and Axis II disorders were assessed clinically, rather than with a structured interview.

In order to shed light on our earlier rhetorical question of who is the aggressive driver, we administered structured psychiatric interviews to court- and self-referred aggressive drivers who were candidates for treatment in a focused cognitive behavioral treatment program. Data on their potential psychiatric morbidity as well as from a group of non-patient controls constitute the data for this paper.

2. Methods

2.1. Participants

There are three sub-populations in this study: 20 court-referred aggressive drivers; 10 self-referred aggressive drivers; and 30 non-aggressive driving controls. The latter were paid to undergo the assessment.

2.1.1. Court-referred aggressive drivers

In an arrangement with the District Attorney and courts of a neighboring county, individuals convicted of aggressive driving offenses were given an option by the court of serving their prescribed sentence or diversion to our Aggressive Driver Program. Included in the diversion were participation in pre-treatment, post-treatment and follow-up assessments as well as attendance at a four-session group cognitive behavioral program.

Because so little is available in the professional literature about aggressive drivers, we present various compilations on individual subject data. In Table 1, the age, gender, and years of driving for the court-referred sample as well as their history of MVAs and traffic citations are presented. Similar data from the self-referred sample is also included in Table 1.

Table 1
Demographic and driving behaviors for court- and self-referred aggressive drivers

Group and subject #	Age	Gender	Years of driving	No. of MVAs	#/Movingviolations	DWI convictions
Court-referred						
1	22	F	4	0	2	0
2	19	M	3	6	4	0
3	18	M	2	2	4	0
4	17	M	2	2	35	0
5	37	M	25	4	7	1
6	21	F	3	2	10	2 (in one night)
7	35	M	10	4	10	4
8	33	F	16	2	4	0
9	55	M	55	2	6	0
10	40	M	24	6	25	0
11	41	M	25	5	5	5
12	40	M	28	3	2	1
13	20	M	4	2	2	1
14	30	M	14	2	1	0
15	28	M	12	0	1	0
16	27	M	14	3	1	0
17	20	M	4	1	2	0
18	20	M	4	1	1	0
19	34	M	17	1	50	1
20	26	F	9	0	4	0
Self-referred						
1	50	F	34	5	1	0
2	43	F	27	1	0	0
3	49	M	33	2	1	1
4	26	M	13	0	9	1
5	40	M	24	5	6	0
6	27	F	11	5	10	0
7	65	M	40	7	6	1
8	50	M	34	5	1	1
9	22	F	6	1	3	0
10	23	F	8	0	2	1

In Table 2 is a tabulation of the offenses for which the court-referred participants were convicted and subsequently diverted to the program. In order to protect confidentiality, the offenses are not paired with any specific subject since the demographics and offense could lead to the identification of a known individual in a sparsely populated county.

These individuals gave written informed consent for the use of their data as well as acknowledgement of the program requirements.

2.1.2. Self-referred aggressive drivers

These 10 individuals responded to local media coverage about the program or advertisements about it. Comparable demographic and driving history on this sub-group are contained in Table 1. They also gave written informed consent for their participation.

2.1.3. Controls

These 30 participants responded to advertisements for individuals to undergo interviews and psychological testing. They were paid US$ 25–50 for their participation and given referrals for mental health services when the current diagnosable psychopathology was identified. They matched the aggressive drivers as a group on gender (33% female for controls vs 30% for aggressive drivers) and on age (X controls=34.5 [SD=12.4] and X aggressive drivers=32.6 [SD=12.5], t [58]=0.59).

2.2. Procedures

As part of the overall assessment for the aggressive drivers, a locally constructed interview to assess the individual's driving history was administered. Next, the participants were assessed with

Table 2
Offenses for which court-referred aggressive drivers were convicted

Offense	Frequency
Assault	2
Assault plus menacing	1
Menacing	1
With a gun	1
With a hammer	1
Harassment	2
Plus disorderly conduct	1
Reckless endangerment plus reckless driving	2
Disorderly conduct plus speeding (100 mph in 55 zone)	1
Plus DWI	1
Plus run stop sign	1
Plus speeding	1
Reckless driving plus speeding	2
Plus crossing hazard marker plus passing on shoulder	1
Speeding (trying to outrun police)	1
Plus unsafe lane change (85 mph)	1

the SCID (First et al., 1996a) for current and past Axis I disorders and SCID-II (First et al., 1996b) for current Axis II disorders.

Following the example of McElroy et al. (1998), we created a SCID-like module to assess for the presence of IED. To qualify for a diagnosis of IED, the court-referred drivers had to describe several impulsive aggressive acts for which adequate provocation did not seem to be present in addition to the incident for which they were arrested. Moreover, inquiry was made if the participant met the criteria for either Borderline Personality Disorder (BPD) or AntiSocial Personality Disorder (ASPD) to be certain that the aggressive acts were not an integral part of the personality disorder (e.g. aggressive acts by someone with BPD which was in response to actual or perceived abandonment would not be counted).

All participants had answered the SCID-II screening questionnaire before the interview. Only personality disorders for which the participant had answered positively for at least one less than the needed number of symptoms or more on the screen were assessed.

3. Results

In Table 3 are tabulations for the Axis I diagnoses for each aggressive driver participant; in Table 4, comparable data for Axis II diagnoses is presented. Summary frequencies are presented in Table 5 along with the value of the comparison statistic.

For each category of disorder, we compared the two groups of aggressive drivers combined to the controls by X^2. We next compared the two subsets of aggressive drivers on these categories.

From Table 3, one can see that five aggressive drivers (four court-referred, one self-referred) were free of all Axis I psychopathology. The most common Axis I diagnosis among aggressive drivers was past alcohol or substance abuse or dependence (n=12, 40%). They met the criteria for past alcohol or substance disorders and for current alcohol or substance abuse to a greater degree than the controls. Altogether, 17 of 30 (56.7%) aggressive drivers either currently have substance problems or have had them in the past. In addition, from Table 3, one can see that several aggressive drivers met the criteria for IED (35% of court-referred, 30% of self-referred aggressive drivers). The two aggressive driving groups do not differ on this diagnosis but show it to a greater degree than the controls (Table 5, X^2[df=1, N=60]=12.0, p=0.001).

Turning to Table 4, one finds 35% of the court-referred aggressive drivers and 50% of the self-referred aggressive drivers meet the criteria for at least one Axis II disorder. Combined, they exceed the proportion of controls with Axis II disorders (see Table 5, X^2[df=1, N=60]=12.27, $p<0.001$). The most common Axis II disorder, is ASPD (23% of all aggressive drivers).

Turning to the comparisons tested in Table 5, we first compared the combined aggressive drivers to the controls; next, the two aggressive driver groups were compared. As noted earlier, the aggressive drivers acknowledged significantly higher levels of IED, current alcohol or substance abuse, past alcohol or substance abuse or dependence. There were also trends for the aggressive drivers to acknowledge more current mood disorders (p=0.08) and current anxiety disorder (p=0.07). Finally, the aggressive drivers acknowledged a higher level of any Axis I diagnosis (p=0.004).

For the Axis II disorders, the aggressive drivers were more likely than the controls to meet the criteria for ASPD and BPD and for any Axis II disorder (p=0.001).

Table 3
Individual participant's Axis I Diagnoses (Note: IED — Intermittent Explosive Disorder, MDD — Major Depressive Disorder, GAD — Generalized Anxiety Disorder, PTSD — Post-Traumatic Stress Disorder, OCD — Obsessive–Compulsive Disorder)

Group and subject #	Diagnoses, Axis I
Court-referred	
1	None
2	
3	IED, GAD, alcohol abuse
4	Substance abuse, past alcohol abuse
5	Past MDD
6	Social phobia, specific phobia, substance abuse, alcohol abuse
7	Past MDD, past PTSD, past alcohol dependence
8	None
9	IED
10	IED
11	IED
12	IED, past substance abuse, past alcohol abuse
13	Past alcohol abuse
14	Depression NOS
15	None
16	IED, past alcohol abuse
17	None
18	IED, depression NOS, substance dependence, past alcohol abuse
19	Past alcohol abuse
20	None
Self-referred	
1	GAD, past MDD, past panic disorder, past binge eating disorder
2	GAD, OCD, specific phobia, panic disorder, past MDD
3	IED, past alcohol dependence
4	IED, OCD, past PTSD, past MDD, past alcohol abuse, past substance abuse
5	Past PTSD, past MDD, past alcohol abuse
6	OCD, somatization disorder, past PTSD, past alcohol abuse
7	Alcohol abuse
8	IED, bipolar II, panic disorder, social phobia, OCD, GAD, alcohol abuse, past PTSD
9	None
10	Alcohol abuse, past MDD

When the two aggressive driver groups were compared on the presence of Axis I disorders, the only significant differences were that the self-referred group acknowledged more current anxiety disorder (p=0.02) and past anxiety disorder (p=0.001) than the court-referred group. There were trends (p=0.058) for the self-referred aggressive drivers to be more likely to meet the criteria for BPD and Obsessive–Compulsive Personality Disorder than the court-referred group.

3.1. Re-analysis on the basis of IED presence

As mentioned in the introduction, IED is an under-studied disorder. For that reason we have re-aggregated the results from the aggressive drivers, sub-divided by the presence or absence of

Table 4
Individual participant's Axis II Diagnoses (sub-threshold refers to instances for which the participant acknowledged one less than the minimum number of symptoms needed to meet the criteria or, for ASPD, did not meet the criteria for Conduct Disorder but did acknowledge enough adult symptoms to meet the DSM-IV criteria)

Group and subject #	Diagnoses, Axis II
Court-referred	
1	None
2	Sub-Antisocial PD
3	Paranoid PD, Antisocial PD, Borderline PD
4	Narcissistic PD, Antisocial PD
5	None
6	Avoidant PD, Antisocial PD
7	None
8	None
9	None
10	Narcissistic PD, Antisocial PD
11	Antisocial PD, Narcissistic PD, Paranoid PD
12	None
13	Sub-Schizoid PD
14	Obsessive–Compulsive PD
15	None
16	Antisocial PD
17	None
18	Sub-Antisocial PD
19	None
20	Sub-Antisocial, Sub-Histrionic, Sub-Narcissistic PD
Self-referred	
1	None
2	Borderline PD, Paranoid PD, Obsessive–Compulsive PD
3	Obsessive–Compulsive PD
4	Antisocial PD, Borderline PD, Sub-Obsessive–Compulsive PD, Sub-Paranoid PD
5	None
6	Histrionic PD
7	None
8	Avoidant PD, Obsessive–Compulsive PD, Paranoid PD,Borderline PD
9	None
10	Sub-Narcissistic PD, Sub-Antisocial PD

IED. Since there were essentially the same proportions (35 and 30%, respectively, for court- and self-referred aggressive drivers) in the two groups, this seems justified.

In Table 6 are the frequencies of the Axis I and Axis II disorders for the aggressive drivers, sub-divided by the presence of IED. Comparisons of these two sub-groups reveal no significant differences on any Axis I comparison, including identical percentages (70%) of both the groups meeting criteria for any Axis I disorder.

Turning to the Axis II disorders, we find a significantly higher fraction of those aggressive drivers with IED to be positive for any Axis II disorder (p=0.01) and for ASPD (p=0.02). There

Table 5
Summary of Axis I and Axis II disorders by group (Note: AgD — Aggressive driver, C — Controls, C-R — Court-referred, S-R — Self-referred)

Diagnosis	Groups (percentage)			Comparison (AgD to C)		Comparison (C-R to S-R)	
	Court	Self	Control	X^2	p	X^2	p
Current mood disorder	10	10	0	3.16	0.08	0.000	1.00
Past mood disorder	15	50	20	0.1	0.75	2.33	0.13
Current anxiety disorder	10	50	6.7	3.27	0.07	5.96	0.02
Past anxiety disorder	5	50	10	1.92	0.17	11.27	0.001
IED	35	30	0	12.00	0.001	.08	.78
Current alcohol or substance abuse	15	30	0	6.67	0.01	0.94	0.33
Past alcohol or substance abuse or dependence	40	40	6.7	9.14	0.002	0.000	1.00
Somatoform disorder	0	10	0	1.18	0.28	2.07	0.15
Eating disorder	0	10	0	1.18	0.28	2.07	0.15
Any Axis I	75	90	36.7	8.15	0.004	0.34	0.56
Antisocial PD	30	10	0	7.93	0.005	1.49	0.22
Borderline PD	5	30	0	4.29	0.04	3.61	0.058
Narcissistic PD	15	0	0	3.16	0.08	1.67	0.2
Obsessive–Compulsive PD	5	30	6.7	0.74	0.39	3.61	0.058
Any Axis II	35	50	6.7	12.27	0.001	0.07	0.8

were also trends (p=0.058) for the aggressive drivers with IED to be more likely to meet criteria for BPD and Paranoid PD.

Table 6
Summary of Axis I and Axis II disorders with or without IED

Diagnosis	Groups (percentage)		Comparison (IED to non-IED)	
	IED	Non-IED	X^2	p
Current mood disorder	20	5	1.67	0.2
Past mood disorder	10	30	1.49	0.45
Current anxiety disorder	30	15	0.37	0.54
Past anxiety disorder	20	25	0.09	0.76
Current alcohol or substance abuse	20	20	0.000	1.00
Past alcohol or substance abuse or dependence	50	35	0.63	0.43
Somatoform disorder	0	5	0.55	0.46
Eating disorder	0	5	0.55	0.46
Any current or past Axis I (except IED)	70	70	0.000	1.00
Antisocial PD	50	10	5.96	0.02
Borderline PD	30	0	3.61	0.058
Narcissistic PD	20	5	1.67	0.2
Obsessive–Compulsive PD	20	5	0.58	0.45
Paranoid PD	30	5	3.61	0.058
Any Axis II	70	45	6.7	0.01

4. Discussion

Aggressive drivers as a group, whether court- or self-referred, are highly likely to meet the criteria for diagnosable psychopathology; they have a high likelihood of meeting the criteria for some current or past Axis I disorder (80%) and for one or more current Axis II disorders (40%).

Notable among the Axis I disorders are past alcohol or substance abuse or dependence (47%), current alcohol or drug abuse (20%), and current IED (33%); in all three of these, the aggressive drivers were more likely to be positive than the controls. This was also the case in ASPD and BPD.

Thus, as a group, aggressive drivers are likely to be impulsive and angry as well as likely to abuse alcohol or other substances. This combination seems potentially dangerous to those who share the roads with these individuals.

The two aggressive driver groups were very similar, especially in the likelihood of meeting the criteria for IED and alcohol or drug problems. The self-referred groups were more likely to meet the criteria for current and past Anxiety Disorders (50% in each instance). They also showed a trend to be more likely to meet the criteria for BPD and Obsessive–Compulsive PD.

4.1. Intermittent Explosive Disorder

As mentioned earlier, IED is an under-studied disorder. Because of that situation, and because it was equally represented in both the aggressive driving groups, we took advantage of the data

set to re-analyze the data from the aggressive drivers, sub-divided on the basis of presence or absence of IED.

Interestingly, we found comparable levels of Axis I psychopathology in both sets of aggressive drivers. This could stem from the relatively small samples. There was a non-significant tendency, in line with McElroy et al.'s (1998) findings for those with IED to be more likely to have a current mood disorder than those aggressive drivers who did not meet the criteria for IED. However, our IED sample did not demonstrate the very high levels of current and past mood disorder noted by McElroy et al. (1998). This could be a sampling issue: we had a small sample and their criminal records were not as severe as McElroy's.

When one examines the results from the Axis II disorders, those aggressive drivers with IED were more likely than those without IED to meet the criteria for one or more personality disorders (70 vs 45%) and for ASPD (50 vs 10%). There were also trends for the IED sub-group to be more likely to meet the criteria for BPD and Paranoid PD.

Both ASPD and BPD can be exclusions for meeting the DSM-IV criteria for IED. However, they are not absolute exclusions; if the angry, explosive episodes are a product of the personality disorder, one should not diagnose IED. In our sample, following McElroy et al.'s (1998) example we were careful to determine that the explosive episodes were not the product of the personality disorder.

Thus, those aggressive drivers who meet the criteria for IED may well have had much more long-standing problems. The presence of the Axis II disorder may also mean that this sub-group of aggressive drivers may be more difficult to treat.

In conclusion, we believe that this detailed examination of a group of aggressive drivers can help to inform the mental health community about the makeup of this growing problem population and alert those who would seek to provide treatment and counseling to this group to the possible co-morbid problems that may be present.

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