HHS Public Access

Author manuscript

J Neuropsychiatry Clin Neurosci. Author manuscript; available in PMC 2016 March 04.

Published in final edited form as:

J Neuropsychiatry Clin Neurosci. 2013 ; 25(3): 229–232. doi:10.1176/appi.neuropsych.12030060.

Aggression, Impulsivity, and Psychopathic Traits in Combined Antisocial Personality Disorder and Substance Use Disorder

Joseph L. Alcorn III, B.S., **Joshua L. Gowin, Ph.D.**, **Charles E. Green, Ph.D.**, **Alan C. Swann, M.D.**, **F. Gerard Moeller, M.D.**, and **Scott D. Lane, Ph.D.**

Dept. of Psychiatry & Behavioral Sciences, School of Medicine, the Program in Neuroscience, Graduate School of Bio-medical Sciences, and the Center for Clinical Research & Evidence-Based Medicine, University of Texas Health Science Center, Houston, TX

Abstract

Aggression, impulsivity, and psychopathic traits are prominent in both antisocial personality disorder (ASPD) and substance use disorders (SUD), but have rarely been examined collectively. The authors' results show that all three variables were elevated in adults with comorbid ASPD/SUD, relative to SUD-only and control subjects.

Individuals with a diagnosis of antisocial personality disorder (ASPD) manifest behavior patterns marked by high levels of aggression and impulsivity, as measured by both psychometric (trait) and laboratory (state) approaches.[1–5] ASPD is further characterized by psychopathic traits, identified by patterns of interpersonal manipulation, callous affect, erratic lifestyle, and criminal tendencies.[6,7] Individuals who show psychopathic traits also tend to have elevated aggressive and impulsive behavior patterns. Correspondingly, individuals with substance use disorders (SUD) also frequently have elevated levels of aggression, impulsivity, and psychopathic traits, and the presence of all three factors during adolescence is a significant risk for SUD.[8] Importantly, the comorbidity of ASPD and SUD is common,[9] and the combination of ASPD+SUD traits present a greater risk for violence than any other single or dual psychiatric diagnosis.[10] Despite these comorbidities and overlapping characteristics, we are unaware of any studies that have compared aggression, impulsivity, and psychopathic traits in both ASPD+SUD and SUD-only groups.

In order to examine relative differences across these groups, the present study used measures of state and trait aggression, impulsive traits, and psychopathic traits to characterize individuals with ASPD+SUD, SUD-only, and healthy-control subjects. Although ASPD and SUD individually share the behavior profiles noted above, the presence of both should impart greater functional impairment and greater severity in these maladaptive behavior patterns. Accordingly, we hypothesized that individuals with combined ASPD and SUD would show higher levels of state and trait aggression, higher trait impulsivity, and higher psychopathic traits, as compared with those with SUD-only and healthy-controls. In this preliminary small-sample report, we measured psychopathy via a self-report psychometric

Send correspondence to Dr. Alcorn or Dr. Scott; Joseph.Alcorn@uth.tmc.edu or scott.d.lane@uth.tmc.edu.

scale. Thus, we treated psychopathy as a dimensional trait, rather than a diagnostic clinical category, as we did not obtain comprehensive diagnostic measures of psychopathy.[18,19]

Methods

All experimental procedures were reviewed and approved by the UTHSC-Houston Institutional Review Board. Informed consent was obtained from all participants before their study participation.

Participants

Potential volunteers responded to advertisements placed in freely-distributed papers in the Houston area. All participants underwent a physical exam and were screened for possible exclusionary medical and psychiatric conditions (e.g., other DSM Axis I disorders, head trauma, neurological impairment, or disease). Subjects were screened for current or past psychiatric illnesses with the Structured Clinical Interview for DSM–IV (SCID). The SCID–II was used to assess criteria for DSM Axis-II personality disorders. Participants were divided into three groups, based on their psychiatric history. Participant demographic characteristics are presented in Table 1. A group of 12 participants (10 men) met criteria for both ASPD and past SUD (ASPD/SUD group). Within the ASPD/SUD group, participants met criteria for past SUD for the following drugs: alcohol (N=3), cocaine (N=3), alcohol/marijuana/cocaine/hallucinogens (N=4); hallucinogens/marijuana/sedatives (N=1); alcohol/cocaine/marijuana/opiate/sedatives (N=1); 15 participants (10 men) met criteria only for past SUD (SUD-only group). Within the SUD-only group, participants met criteria for past SUD for the following drugs: al cohol (N=4), marijuana (N=1), stimulant (n=1), alcohol/cocaine (N=2), alcohol/marijuana (N=3), alcohol/marijuana/cocaine/sedative (N=3), hallucinogen/marijuana/sedative (N=1); 16 participants (10 men) did not meet criteria for any Axis I or Axis II DSM–IV diagnosis (control group). Individuals with a current SUD diagnosis or who smoked >10 cigarettes per day were excluded to rule out potential confounds of acute intoxication or withdrawal during test days, both of which can affect performance on the type of test measures used herein.[16,17] All participants provided test-day breath and urine samples for complete drug screening and breath-alcohol analysis. All reported test-day samples were drug- and alcohol-free.

Procedure

Participants completed a 2-day study. On Day 1, participants completed four sessions of a modified version of the Point Subtraction Aggression Paradigm (PSAP).[1] On Day 2, participants completed questionnaires related to trait aggression, impulsivity, and psychopathy. During the consent process, all participants were provided information about potential earnings, breath-alcohol and urine drug screening, and the experimental procedures.

Measures

Point-Subtraction Aggression Paradigm—Aggressive responding (state aggression) was measured by use of a modified version of the Point Subtraction Aggression Paradigm, or PSAP, an established and externally valid laboratory measure of human state

aggression.[11] The PSAP uses instructional deception and random, repeated aversive provocations (monetary subtractions) attributed to another (fictitious) person to evoke bouts of aggressive responding that result in ostensible monetary subtractions to the other person. Mean number of aggressive responses per provocation from PSAP Sessions 2, 3, and 4 were used as the dependent measure of state aggression. Details of the procedure can be found at https://xfiles.uth.tmc.edu/Users/slane/PSAP_details/PsychopathyPSAPAppendix.pdf.

Impulsive Premeditative Aggression Scale (IPAS[2])—The IPAS is a self-report measure of trait aggression, validated in prison populations, consisting of 30 items measuring aggressive acts within the last 6 months.[2] It consists of two orthogonal scales, Impulsive Aggression (IA) and Premeditative Aggression (PM). Published internal consistencies (Cronbach's α) of the IA and PM subscales are 0.74 and 0.75, respectively. Both subscales were used in the data analysis.

The Buss-Perry Aggression Questionnaire (BPAQ,[12])—The BPAQ is a self-report measure of trait aggression consisting of 29 items. It is well validated in populations with both Axis I and Axis II disorders. In young adults, the published internal consistency coefficients range from 0.72 to 0.85. Total score was used in the data analyses.

The Barratt Impulsivity Scale (BIS–11,[13])—The BIS–11 is a self-report measure of the personality trait of impulsivity, consisting of 30 items. It has been used extensively in the study of many different psychiatric disorders, including ASPD and SUD.[14] The published internal consistency coefficients range from 0.72 to 0.85. Total score was used in the data analyses.

The Self-Report Psychopathy Scale–III (SRP–III[6,7])—The SRP–III is a self-report measure of the clinical construct of psychopathy, consisting of 64 items, developed from the well-established Psychopathy Checklist–Revised.[15] Among young adults, the reported overall internal consistency coefficient is 0.81. The total psychopathy score was used in the data analyses.

Data Analysis

A MANOVA was conducted to model the multivariate profile of six dependent variables (PSAP aggressive responses, IA and PM scales on the IPAS, total score on the BPAQ, total score on the BIS–11, and total score on the SRP–III) as a function of group membership (APSD +SUD, SUD-only, Control). For the MANOVA, standardization of all six dependent variables (mean of 0 and standard deviation [SD] of 1) ensured comparable scaling. Significance was defined as $p < 0.05$, with two-tailed testing.

Results

Summary data for all dependent measures for each group are presented in Table 1. The MANOVA test reached significance (Wilks' Lambda=0.56; F[2, 37]=2.18; p=0.029), indicating that the linear combination of the six measures was significantly dependent on group membership. Table 1 shows that the ASPD+SUD group was higher, on average, across all dependent measures, relative to the SUD-only and control groups. Separate

univariate ANOVAs were conducted to determine which of the six measures showed the largest group differences. F scores, p values, and effect-size estimates are provided in Table 2, demonstrating that the BPAQ, BIS–11, and SRP– III all showed significant group differences, with SRP–III having the greatest effect size (0.39).

Discussion

In this preliminary investigation, the combination of ASPD+SUD conferred higher levels of aggression, impulsivity, and psychopathy relative to SUD-only and the control group. Limitations include a small sample size, limiting generalizability of the findings, a lack of gender balance (the sample was predominantly male), obscuring a potentially unique profile in women and/or unique profiles in combined borderline personality+SUD, and the use of a self-report dimensional measure of psychopathic traits in the absence of more extensive diagnostic interview data to better characterize psychopathy, for example, the Gacono and Meloy Rorschach assessment.[19] The small sample limitation is partially mitigated by the large effect size for the overall MANOVA, (Wilks' Lambda: 0.56), suggesting that the combined measures effectively captured important differences among the three groups.

The data highlight the clinical relevance of comorbid ASPD+SUD as an important risk factor for deficiencies in inhibitory and affective control. It has been established that this combination presents elevated risk for community violence.[10] Also, SUD and ASPD have individually been associated with dysfunction in inhibitory process and affective stability.[4,5,8,9] The present data argue that this inhibitory-affective instability is magnified when both disorders are present, along with a greater likelihood of psychopathic traits. SUD is highly prevalent in individuals with ASPD, although the converse is less common. The clinical neuroscience literature suggests a common link across these disorders— and across aggression, impulsivity, and psychopathy. Specifically, disrupted striatal–prefrontal/orbitofrontal circuitry is well established,[20] where interrelated neural tracks controlling affective, reward/punishment, and inhibitory processing show differential response and connectivity, relative to control populations. Acknowledging the need for replication of these results with a larger sample size, implications for intervention suggest careful screening for ASPD+SUD comorbidity and psychotherapies and pharmacotherapies focused on stabilizing behavioral and affective processes.

Acknowledgments

We thank Ellen Desmarais, Tara Watts, Nuvan Rathnayaka, and Irshad Prasla for valuable technical assistance in conducting the research. We thank Dr. Delroy Paulhus and Dr. Matthew Stanford for providing psychometric instruments and valuable advice on proper scoring and utilization.

All work was conducted in the Dept. of Psychiatry & Behavioral Sciences, University of Texas Health Science Center, Houston, TX.

This work was funded by NIH grants DA R01 003166 and DA P50 09262.

References

1. Cherek DR, Lane SD. Effects of d,l-fenfluramine on aggressive and impulsive responding in adult males with a history of conduct disorder. Psychopharmacology (Berl). 1999; 146:473–481. [PubMed: 10550498]
2. Stanford MS, Houston RJ, Mathias CW, et al. Characterizing aggressive behavior. Assessment. 2003; 10:183–190. [PubMed: 12801190]
3. Nouvion SO, Cherek DR, Lane SD, et al. Human proactive aggression: association with personality disorders and psychopathy. Aggress Behav. 2007; 33:552–562. [PubMed: 17654689]
4. Fossati A, Barratt ES, Borroni S, et al. Impulsivity, aggressiveness, and DSM-IV personality disorders. Psychiatry Res. 2007; 149:157–167. [PubMed: 17157921]
5. Rogers R, Jordan MJ, Harrison KS. Facets of psychopathy, Axis II traits, and behavioral dysregulation among jail detainees. Behav Sci Law. 2007; 25:471–483. [PubMed: 17620323]
6. Mahmut MK, Menictas C, Stevenson RJ, et al. Validating the factor structure of the Self-Report Psychopathy Scale in a community sample. Psychol Assess. 2011; 23:670–678. [PubMed: 21517188]
7. Paulhus, DL.; Neuman, CF.; Hare, RD. Manual for the Self-Report Psychopathy Scale. Toronto, Canada: Multi-Health Systems; 2010.
8. Tarter R, Vanyukov M, Giancola P, et al. Etiology of early age onset substance use disorder: a maturational perspective. Dev Psychopathol. 1999; 11:657–683. [PubMed: 10624720]
9. Krueger RF, Hicks BM, Patrick CJ, et al. Etiologic connections among substance dependence, antisocial behavior, and personality: modeling the externalizing spectrum. J Abnorm Psychol. 2002; 111:411–424. [PubMed: 12150417]
10. Arseneault L, Moffitt TE, Caspi A, et al. Mental disorders and violence in a total birth cohort: results from The Dunedin Study. Arch Gen Psychiatry. 2000; 57:979–986. [PubMed: 11015816]
11. Cherek, DR.; Pietras, CJ.; Lane, SD. Laboratory measures: Point Subtraction Aggression Paradigm (PSAP), in Aggression: Assessment, and Treatment. Coccaro, E., editor. New York: Marcel Dekker; 2003. p. 215-228.
12. Buss AH, Perry M. The Aggression Questionnaire. J Pers Soc Psychol. 1992; 63:452–459. [PubMed: 1403624]
13. Patton JH, Stanford MS, Barratt ES. Factor structure of the Barratt Impulsiveness Scale. J Clin Psychol. 1995; 51:768–774. [PubMed: 8778124]
14. Swann AC, Lijffijt M, Lane SD, et al. Interactions between bipolar disorder and antisocial personality disorder in trait impulsivity and severity of illness. Acta Psychiatr Scand. 2010; 121:453–461. [PubMed: 20064125]
15. Hare RD, Neumann CS. Psychopathy as a clinical and empirical construct. Annu Rev Clin Psychol. 2008; 4:217–246. [PubMed: 18370617]
16. Heishman SJ. Behavioral and cognitive effects of smoking: relationship to nicotine addiction. Nicotine Tob Res. 1999; 1(Suppl 2):S143–S147. Discussion S165–S166. [PubMed: 11768172]
17. Parrott AC. Nicotine psychobiology: how chronic-dose, prospective studies can illuminate some of the theoretical issues from acute-dose research. Psychopharmacology (Berl). 2006; 184:567–576. [PubMed: 16463194]
18. Neumann CS, Hare RD, Johansson PT. The Psychopathy Checklist-Revised (PCL–R), Low Anxiety, and Fearlessness: A Structural Equation Modeling Analysis. Personal Disord. 2012
19. Gacono, CB.; Meloy, RJ. The Rorschach Assessment of Aggressive and Psychopathic Personalities. Boca Raton, FL: Taylor & Francis; 1994.
20. Siever LJ. Neurobiology of aggression and violence. Am J Psychiatry. 2008; 165:429–442. [PubMed: 18346997]

Table 1
Summary of Demographic and Dependent Measures in Each Group

Dependent Variable	ASPD+SUD	Control	SUD
Age	32.2 (8.2)	30.9 (8.5)	34.0 (9.8)
Years of use	7.8 (9.9)	—	4.1 (3.8)
Education, years	11.7 (1.7)	13.45 (2.1)	13.14 (2.2)
Shipley–2[a]	205.7 (24.5)	199.5 (28.9)	183.6 (26.8)
PSAP Aggressive responses	59.8 (36.5)	52.1 (33.2)	48.9 (36.1)
PM-IPAS	22.7 (6.8)	21.1 (3.4)	18.5 (6.3)
IA-IPAS	28.6 (6.6)	24.6 (4.9)	26.13 (6.7)
BPAQ Total Score	77.2 (24.6)	57.3 (13.7)	58.7 (16.1)
BIS–II Total Score	62.0 (9.6)	52.1 (5.5)	59.7 (9.3)
SRP-III Total Score	186.3 (38.7)	128.6 (20.8)	144.2 (23.2)

Values are mean (standard deviation). There were no statistically significant between-group differences in age, education, or Shipley–2 score. Years of use: the average number of years in which subjects used a drug for which SUD criteria were met; ASPD: antisocial personality disorder; SUD: substance use disorder.

[a]Shipley–2: Shipley Institute of Living Scale–2: Vocabulary+Block Forms Composite Score (Shipley et al., 2009, Western Psychological Services, CA)

PSAP: Point Subtraction Aggression Paradigm; PM-IPAS: Impulsive Premeditated Aggression Scale–Premeditated Subscale; IA-IPAS: Impulsive Premeditated Aggression Scale–Impulsive Subscale; BPAQ: Buss-Perry Aggression Questionnaire; BIS–II: Barratt Impulsiveness Scale–II; SRP-III: Self Report of Psychopathy Scale–III.

Table 2
Results of One-Way ANOVA Conducted Among Groups on All Six Dependent Measures

Dependent Variable	F[df]	p	Bonferroni post-hoc tests	Omega^2
PSAP Aggressive responses	0.15 [2, 39]	NS	—	—
PM-IPAS	1.89 [2, 39]	NS	—	—
IA-IPAS	1.44 [2, 39]	NS	—	—
BPAQ Total Score	4.82 [2, 39]	0.013	*a*, *b*	0.15
BIS–II Total Score	5.53 [2, 38]	0.007	*a*, *c*	0.19
SRP-III Total Score	15.16 [2, 39]	0.000	*a*, *b*	0.39

[a] ASPD+SUD > Control;

[b] ASPD+SUD > SUD-only;

[c] SUD > Control.

PSAP: Point Subtraction Aggression Paradigm; PM-IPAS: Impulsive Premeditated Aggression Scale–Premeditated Subscale; IA-IPAS: Impulsive Premeditated Aggression Scale–Impulsive Subscale; BPAQ: Buss-Perry Aggression Questionnaire; BIS–II: Barratt Impulsiveness Scale–II; SRP-III: Self Report of Psychopathy Scale–III.