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Intergenerational Childhood Maltreatment in Persons with DSM-IV Pathological Gambling and their First-degree Relatives

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Abstract

This study investigates the characteristics of individuals with DSM-IV pathological gambling (PG) who experienced childhood maltreatment and rates of maltreatment occurring in their first-degree relatives (FDRs). 94 subjects with DSM-IV PG, 91 controls, and 312 first-degree relatives (FDRs) were assessed for childhood maltreatment as part of a family study of PG. Maltreatment was evaluated using the Revised Childhood Experiences Questionnaire. The Family Assessment Device was used to evaluate the functionality of the PG subject's (or control's) family of origin. Data were analyzed using logistic regression by the method of generalized estimating equations. Rates of maltreatment were significantly higher in subjects with PG than controls (61% vs. 25%, $P < 0.001$). Subjects with PG who experienced maltreatment were more likely to be female, had more severe PG symptoms, had co-occurring mood and anxiety disorders, and reported greater early family life dysfunction than those with PG who did not experience maltreatment. Rates of maltreatment were higher in FDRs of PG subjects than controls (41% vs. 24%, $P = .002$). Rates in FDRs of individuals with PG who experienced maltreatment themselves were still higher than in FDRs of those with PG who did not experience maltreatment (50% vs. 28%, $P = .009$). The former were also more likely to have anxiety disorders, substance use disorders, and suicide attempts. The results suggest that childhood maltreatment in persons with PG is common and intergenerational. Rates of maltreatment in FDRs of PG subjects are high, particularly among those who experienced abuse. The implications of the findings are discussed.

Keywords

abuse; maltreatment; trauma; gambling disorder; family studies

Pathological gambling (PG) is a common and problematic behavioral disorder associated with domestic violence, depression, substance misuse, and suicide (NORC, 1999; Argo & Black, 2004; Kessler et al., 2008; Lesieur, 1984; Petry & Kiluk, 2002; Petry et al., 2005; Shaw et al., 2007). In the general adult population, nearly 90% of adults gamble and 1.2%–

3.4% develop PG, the most severe form of disordered gambling (Kessler et al., 2008; Petry et al., 2005).

Research shows that childhood maltreatment is commonly reported by persons with PG. This is not surprising considering that these families are often described as dysfunctional, with many family members having mental health or addictive disorders (Afifi et al., 2010; Black et al., 2012; Grant & Kim, 2002). The maltreatment may also be responsible in part for elevated rates of posttraumatic stress disorder, borderline personality disorder, and other conditions found in persons with PG who have experienced childhood verbal, emotional, physical, or sexual abuse (Argo & Black, 2004; Kessler, 2008; Najavits et al., 2010).

There are relatively few studies of the intergenerational transmission of childhood maltreatment and family dysfunction in the context of PG (Afifi et al., 2010; Hodgins et al., 2010; Oliver, 1993; Renner & Slack, 2006; Scherrer et al., 2007). The relationship between maltreatment, family dysfunction, PG, and co-occurring mental health and addictive disorders is complex. These interrelationships are important to explore in order to provide the field with a better understanding of the possible heritability of these conditions which could lead to more targeted treatments.

This analysis presents data from a family study of PG. The purpose is to examine characteristics of PG subjects with a history of childhood maltreatment, and to evaluate the presence of maltreatment in their first-degree relatives (FDRs). We expected that individuals with PG who experienced maltreatment would have even higher rates of mental health and addictive disorders than those with PG who did not experience maltreatment.

Methods

Subjects with PG were recruited from the community. Controls were recruited via random digit dialing through the Center of Social and Behavioral Research at the University of Northern Iowa (Cedar Falls, IA) and were group matched to those with PG for age, sex, and educational level. Both subjects with PG and controls were interviewed between February 2005 and June 2010. Individuals with PG had a South Oaks Gambling Score (SOGS) (Lesieur & Blume, 1987) ≥ 5 , a National Opinion Research Center (NORC, 1999) DSM Screen for Gambling Problems (NODS) lifetime score ≥ 5 , and met lifetime DSM-IV PG criteria (American Psychiatric Association, 1994). The SOGS is a screening tool used to identify likely cases of PG. The NODS is a structured instrument used to diagnose PG. Subjects with PG and controls had to be able to speak English and be ≥ 18 years of age. Subjects with psychotic, cognitive, or chronic neurological disorders (e.g., Parkinson's disease) were excluded. Controls had a SOGS score ≤ 2 and a NODS score of 0. Written informed consent was obtained from all subjects according to procedures approved by the University of Iowa Institutional Review Board.

Subjects with PG and controls were interviewed in person. Permission was obtained to interview their respective FDRs ≥ 18 years who were then contacted and invited to participate in a telephone interview. Informant interviews were conducted for FDRs who

were deceased, chose not to participate, could not be located, or when the proband refused to allow contact.

A blind consensus procedure was used to make diagnostic assignments for each study subject. Raw materials, which included a brief narrative summary prepared by the interviewer, were reviewed independently by two of three senior study psychiatrists. If all required criteria were met, then a definite diagnosis was assigned. If any necessary criterion was absent then a diagnosis was considered “probable.” If it seemed likely that the subject had the diagnosis, yet the diagnosticians could not be certain of a given criterion, then the diagnosis was made at the “possible” level. If the diagnosticians could not be sure of the presence or absence of a given diagnosis, then that diagnosis was recorded as unknown. Only definite and probable cases of PG were included in the analyses.

Social and demographic data was collected from all subjects, including age, sex, marital status, educational level and current occupational status. Childhood maltreatment was assessed using the Revised Childhood Experiences Questionnaire (Zanarini et al., 1989), a semi-structured interview with good to moderate psychometric properties. The instrument assessed the presence of the following five types of maltreatment: neglect, and emotional, verbal, physical and sexual abuse.

The Family Assessment Device (FAD; Epstein et al., 1983) was administered to assess six dimensionally-measured subscales that tap distinct facets of family life: problem solving, communication, roles, affective responsiveness, affective involvement, and behavior control. A scale assessing overall level of family functioning (“General Functioning”) was also included. In addition to yielding dimensional scores on the subscales, scores can be dichotomized as “healthy” or “unhealthy.” The scale pertains to the subject’s family of origin.

Statistical Analysis

Subject groups were defined by PG status (PG, control) and childhood maltreatment status (present, absent). The groups were compared on demographic, social, and clinical characteristics using the Chi-square test (or Fisher’s exact test) for categorical variables and the Mann-Whitney test for dimensional variables.

Chi-square tests were used to compare the groups for the presence or absence of childhood maltreatment in FDRs. First, PG FDRs were compared to control FDRs. Next, PG FDRs who experienced maltreatment and PG FDRs who did not experience maltreatment were compared. Families were classified as dysfunctional if the person with PG or the control’s general functioning score on the FAD was 2.0 or higher. PG FDRs with a history of family dysfunction and PG FDRs without a history of family dysfunction were compared for childhood maltreatment. The Chi-Square tests do not account for within-family correlation in the outcomes or possible confounding variables.

Logistic regression was used to compare childhood maltreatment rates among the PG and control FDRs. Generalized estimating equation (GEE) models with compound symmetry were used to account for within-family correlations, and covariates (sex, relationship to

subject with PG or control, years of education, and sex) were used to address possible confounding. First, we tested whether each maltreatment type was more prevalent in PG FDRs compared to control FDRs. The model included subject group (PG, control) and the covariates as independent variables. Next, we tested whether each maltreatment type was more prevalent in PG FDRs compared to control FDRs after controlling for whether the person with PG had experienced the same maltreatment. If the PG group effect is significant in Model 1 and retains its significance in Model 2, it would suggest that PG and maltreatment are transmitted independently. If the PG group effect is significant in Model 1 but not Model 2, it would suggest that PG and maltreatment may share a common family etiology. Each model provided an odds ratio and 95% confidence interval for comparing PG relatives to control relatives. All statistical tests were 2-tailed with $\alpha = 0.05$.

Results

Childhood maltreatment was assessed in 94 persons with PG and 91 controls. Among people with PG, 57 (61%) reported at least one type of childhood maltreatment compared with 23 (25%) controls ($\chi^2=23.6$, $P<0.001$). Among people with PG who experienced maltreatment, 79% reported verbal abuse, 67% emotional abuse, 42% physical abuse, 39% sexual abuse, and 25% neglect. Among controls, 19% reported verbal abuse, 12% emotional abuse, 13% physical abuse, 7% sexual abuse, and 7% neglect.

Table 1 shows demographic, social, and clinical variables comparing subjects with PG to controls and those with PG who experienced maltreatment to those with PG who did not experience maltreatment. Subjects with PG who experienced maltreatment were more likely to be female compared to people with PG who did not experience maltreatment (72% vs. 38%). Divorce rates were higher among subjects with PG, but similar among those who did and did not experience maltreatment. PG severity (SOGS score, number of DSM-IV PG criteria present) was greater among those with PG who had experienced maltreatment than among those who did not. Impulsiveness was greater among those with PG, but similar among those with PG who had and had not experienced maltreatment. Rates of comorbid mental health and addictive disorders were highest among subjects with PG who had experienced maltreatment, followed by those with PG who had not experienced maltreatment, followed by controls.

Among those with PG who had experienced maltreatment, 81% had a lifetime mood disorder, 72% had a lifetime substance use disorder, and 58% had a lifetime anxiety disorder. Among people with PG who had experienced maltreatment, 42% had attempted suicide at least once, compared to 24% among those with PG who had not experienced maltreatment, and 4% among controls.

Rates of mental health and addictive disorders were highest in FDRs of people with PG who had experienced maltreatment. Anxiety disorders, substance use disorders, and attempted suicide were more common in families of subjects with PG who experienced maltreatment, compared to families of those with PG who did not experience maltreatment.

Family dysfunction, as assessed with the general functioning scale of the FAD, was reported more often in people with PG who experienced maltreatment (63%) than in subjects with PG who did not experience maltreatment (41%) or in controls (33%).

Maltreatment was assessed in 144 PG FDRs and 168 control FDRs. Any type of maltreatment was reported by 41% of PG FDRs compared with 24% of control FDRs ($\chi^2=9.8$, $P=.002$). Rates of emotional abuse, neglect, physical abuse and verbal abuse were significantly higher in PG FDRs, while rates of sexual abuse did not significantly differ (Table 2).

Rates of maltreatment were significantly higher for FDRs of subjects with PG who experienced maltreatment than in FDRs of PG probands who did not experience maltreatment (Table 3). Fifty percent of FDRs of people with PG who experienced maltreatment reported abuse themselves, compared to 28% among FDRs of people with PG who did not experience maltreatment ($\chi^2=6.8$, $P=.009$). In these two groups, respectively, rates of emotional abuse (36% vs. 11%), physical abuse (28% vs. 12%), verbal abuse (40% vs. 19%), and sexual abuse (15% vs. 2%) showed similar patterns; rates of neglect (17% vs. 11%) were not significantly different. Rates of childhood maltreatment did not vary significantly among FDRs of people with PG who reported family dysfunction and FDRs of people with PG who did not report family dysfunction (Table 3).

The group comparisons of childhood maltreatment among PG and control FDRs (Table 2) did not account for possible confounding variables or within-family correlation. Logistic regression models using GEE were used to compare the two groups to address these limitations (Table 4). From Model 1, the FDRs of people with PG were more likely to experience each type of childhood maltreatment with the exception of sexual abuse. The group differences were largest for neglect (OR=8.77, 95% confidence interval [2.52, 30.5]), followed by emotional abuse (OR=3.10, 95% confidence interval [1.57, 6.13]) and verbal abuse (OR=2.93, 95% confidence interval [1.62, 5.29]). In Model 2, maltreatment experienced by those with PG was added as a covariate. For all types of maltreatment except physical abuse, the rate of maltreatment was significantly higher in FDRs of people with PG who experienced maltreatment compared to FDRs of people with PG who did not experience maltreatment. In Model 2, group membership (PG or control) remained significantly predictive of emotional abuse, neglect, physical abuse, and verbal abuse. These results suggest that PG and maltreatment status have independent effects on risk of emotional abuse, neglect, physical abuse, and verbal abuse in FDRs and do not share a common familial etiology. The largest risk associated with PG was observed for neglect (OR=6.60, 95% confidence interval [1.96, 22.17]), followed by physical and emotional abuse.

Discussion

The data show that individuals with PG experience high rates of childhood maltreatment of all types compared to controls providing further confirmation of this association (Afifi et al., 2010; Black et al., 2012; Hodgins et al., 2010; Petry & Steinberg, 2005; Scherrer et al., 2007). Additionally, those with PG who experienced maltreatment had higher levels of

gambling severity, and higher rates of comorbid mood and anxiety disorders than persons with PG who did not experience maltreatment. They were also more likely to have experienced a dysfunctional family of origin. Although in our study childhood maltreatment is a marker of syndromal severity, not all researchers have reported this (Leppink & Grant, 2015), perhaps because of different populations or methods of assessment. The results extend the literature on the complex interrelationship between childhood maltreatment and PG and show that maltreatment is a robust risk factor for co-occurring mental health disorders, as well as a family history of mental health disorders, addictions, and suicidality (Ashley & Boehlke, 2012; Black et al., 2006; Black & Moyer, 1998; Kessler et al., 2008; Leppink & Grant, 2015; Petry et al., 2005; Winslow et al., 2010).

The data are not surprising because childhood maltreatment often occurs in the context of chaotic family dynamics, a problem with which PG has long been associated (Shaw et al., 2007; Black et al., 2012). For example, one survey of spouses of pathological gamblers found that nearly half reported physical or verbal abuse initiated by the gambler (Lorenz & Shuttlesworth, 1983). Muelleman et al. (2002) reported an association between intimate partner violence and problematic gambling behavior, providing further confirmation of the association.

Family studies of PG, including our own (Black et al., 2003; 2006; 2014), show high rates of mental disorders and addictions in the FDRs of people with PG, including elevated rates of mood, anxiety, substance misuse, and personality disorders (Kessler et al., 2008; Linden et al., 1986; Petry et al., 2005; Ramirez et al., 1983; Roy et al., 1988; Walters, 2001). Familial psychiatric disorders or addictions further contribute to the overall level of dysfunction found in these families.

Importantly, we showed that FDRs of subjects with PG report high rates of childhood maltreatment themselves, thereby confirming that trauma is intergenerational in these families. We found that FDRs of PG subjects who had themselves experienced maltreatment were at even greater risk of maltreatment than FDRs of PG subjects who had not experienced maltreatment. While research in the area of childhood maltreatment and PG has shown that relatives of pathological gamblers are likely to suffer physical and emotional abuse (Darbyshire et al., 2001; Lorenz, 1987; Volberg, 1994), this is the first demonstration that abuse is intergenerational.

We used logistic regression models to test for independent effects of familial PG and familial maltreatment on maltreatment in FDRs. The results suggest that PG and maltreatment have independent effects on the risk of emotional abuse, neglect, physical abuse, and verbal abuse. The independent risk from PG was most pronounced for neglect, followed by physical and emotional abuse. It is possible that risk of childhood maltreatment, particularly neglect, increases in families with a history of PG because of the gambler's financial stress, preoccupation with gambling, or his or her increased drug or alcohol abuse.

Finally, it is important to consider the practical implications of our findings. In practice, this data should influence, at least partially, the approach to assessment and management of patients by health care providers. It is important to recognize patients that are at risk for

maltreatment, and at higher risk for abusing their own family members, in order to intervene effectively and to help prevent the transmission of abuse. It is also important to know if there is an increased risk of psychiatric comorbidities in a patient or their family. If a patient does have a history of maltreatment along with PG, providers should be aware that it is significantly more likely to have maltreatment within the patient's family, and psychiatric comorbidities, than a patient with a history of maltreatment or PG alone.

The study's limitations should be acknowledged. First, the low participation rate of minority subjects reduces the generalizability of our findings in these populations. Second, subjects may have agreed to participate based on personal or family concerns about emotional illness. Third, not all interviews were direct and in person; relatives were mostly interviewed by telephone and it is possible that some disorders were missed. Fourth, some relatives could not be interviewed due to death or other reasons, and while we aimed to include these relatives by conducting informant (proxy) interviews, it is possible that some disorders were missed because the relatives were not sufficiently familiar with the individual. Last, the assessment of childhood maltreatment was imperfect as this was not the main objective of the study, although the results are based on reliable and valid instruments.

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Social, demographic, and clinical features of probands with pathological gambling having experienced any type of abuse versus those without

Table 1

Variable	PG Subjects with maltreatment (n=57)	PG Subjects without maltreatment (n=37)	Controls (n=91)	PG vs. control		PG: maltreatment comparison	
				χ^2 , df	P-value	χ^2 , df	P-value
Age, years, mean (SD)	47.8 (10.4)	42.2 (15.4)	49.4 (16.0)	2.3, 1	0.126	3.5, 1	0.060
Female, no. (%)	41 (72%)	14 (38%)	57 (63%)	0.3, 1	0.566	10.7, 1	0.001
Caucasian-European, no. (%)	48 (84%)	33 (89%)	86 (95%)	3.7, 1	0.056	0.5, 1	0.495
Education, years, mean (SD)	13.9 (1.9)	14.4 (1.9)	15.2 (2.4)	7.7, 1	0.001	1.3, 1	0.257
PG age at onset, years, mean	35.9 (12.1)	32.4 (14.1)				2.5, 1	0.111
SOGS, mean (SD)	14.3 (3.2)	11.8 (3.7)	0.2 (0.4)			10.6, 1	0.001
NODS, mean (SD)	14.5 (3.9)	13.0 (4.5)	0.0 (0.0)			2.7, 1	0.100
# DSM-IV PG criteria, mean (SD)	8.8 (1.4)	8.1 (1.5)	0.0 (0.0)			5.8, 1	0.016
BIS, mean (SD)	70.5 (12.6)	69.5 (10.4)	57.1 (9.6)	49.8, 1	<0.001	0.1, 1	0.808
Ever divorced, no. (%)	27 (63%)	17 (65%)	23 (27%)	20.9, 1	<0.001	0.0, 1	0.828
Psychiatric comorbidity							
Mood disorder, no. (%)	46 (81%)	21 (57%)	27 (30%)	32.5, 1	<0.001	6.3, 1	0.012
Anxiety disorder, no. (%)	33 (58%)	12 (32%)	20 (22%)	13.6, 1	<0.001	5.8, 1	0.016
Substance use disorder, no. (%)	41 (72%)	23 (62%)	25 (27%)	30.5, 1	<0.001	1.0, 1	0.321
Eating disorder, no. (%)	10 (18%)	3 (8%)	0 (0%)	13.5, 1	<0.001	1.7, 1	0.195
Antisocial personality disorder, no. (%)	11 (20%)	2 (6%)	1 (1%)	11.0, 1	<0.001	3.6, 1	0.058
Suicide attempt, no. (%)	24 (42%)	9 (24%)	4 (4%)	27.3, 1	<0.001	3.1, 1	0.078
Family history							
Mood disorder, no. (%)	46 (81%)	29 (78%)	56 (62%)	6.7, 1	0.010	0.1, 1	0.784
Anxiety disorder, no. (%)	38 (67%)	17 (46%)	47 (52%)	0.9, 1	0.348	4.0, 1	0.046
Substance use disorder, no. (%)	52 (91%)	24 (65%)	56 (62%)	8.4, 1	0.004	10.1, 1	0.002
Eating disorder, no. (%)	8 (14%)	4 (11%)	10 (11%)	0.1, 1	0.709	0.2, 1	0.647
Gambling disorder, no. (%)	29 (51%)	12 (32%)	6 (7%)	33.4, 1	<0.001	3.1, 1	0.078
Suicide attempt, no. (%)	19 (33%)	4 (11%)	12 (13%)	3.8, 1	0.050	6.2, 1	0.013
Unhealthy FAD General Functioning score, no. (%)	34 (63%)	13 (41%)	28 (33%)	8.5, 1	0.004	4.0, 1	0.044
Type of maltreatment							

Variable	PG Subjects with maltreatment (n=57)	PG Subjects without maltreatment (n=37)	Controls (n=91)	PG vs. control		PG: maltreatment comparison	
				χ^2 , df	P-value	χ^2 , df	P-value
Emotional, no. (%)	38 (67%)	0 (0%)	11 (12%)	19.1, 1	<0.001		
Neglect, no. (%)	14 (25%)	0 (0%)	6 (7%)	3.3, 1	0.069		
Physical, no. (%)	24 (42%)	0 (0%)	12 (13%)	4.5, 1	0.034		
Verbal no. (%)	45 (79%)	0 (0%)	17 (19%)	17.7, 1	<0.001		
Sexual, no. (%)	22 (39%)	0 (0%)	6 (7%)	10.0, 1	0.002		

Note: FET = Fisher's Exact test; SOGS=South Oaks Gambling Screen; NODS= National Opinion Research Center DSM Screen for Gambling Problems; BIS=Barratt Impulsiveness Ie; FAD=Family Assessment Device

Table 2
Prevalence of maltreatment in FDRs of Subjects with PG with and without a history of maltreatment, and controls

Variable	FDRs of PG Subjects with maltreatment (n=86)	FDRs of PG Subjects without maltreatment (n=57)	FDRs of controls (n=168)	PG FDRs vs. control FDRs		PG FDRs: maltreatment comparison	
				χ^2 , df	P-value	χ^2 , df	P-value
Childhood maltreatment							
Emotional, no. (%)	31 (36%)	6 (11%)	18 (11%)	12.0, 1	<0.001	11.6, 1	<0.001
Neglect, no. (%)	15 (17%)	6 (11%)	6 (4%)	11.9, 1	<0.001	1.3, 1	0.253
Physical, no. (%)	24 (28%)	7 (12%)	17 (10%)	7.8, 1	0.005	4.9, 1	0.026
Verbal, no. (%)	34 (40%)	11 (19%)	26 (15%)	11.0, 1	<0.001	6.5, 1	0.011
Sexual, no. (%)	13 (15%)	1 (2%)	15 (9%)	0.1, 1	0.810	6.9, 1	0.009
Any type of maltreatment, no. (%)	43 (50%)	16 (28%)	41 (24%)	9.8, 1	0.002	6.8, 1	0.009

Table 3

Prevalence of maltreatment in FDRs of subjects with PG: with and without family dysfunction

Variable	FDRs of PG Subjects with family dysfunction (n=70)	FDRs of PG Subjects without family dysfunction (n=67)	PG FDRs: family dysfunction comparison	
			χ^2 , df	P-value
Childhood maltreatment				
Emotional, no. (%)	21 (30%)	14 (21%)	1.5, 1	0.222
Neglect, no. (%)	12 (17%)	8 (12%)	0.7, 1	0.389
Physical, no. (%)	13 (19%)	15 (22%)	0.3, 1	0.580
Verbal, no. (%)	22 (31%)	19 (28%)	0.2, 1	0.695
Sexual, no. (%)	9 (13%)	5 (8%)	1.1, 1	0.297
Any type of maltreatment, no. (%)	30 (43%)	25 (37%)	0.4, 1	0.508

Table 4

GEE comparison of prevalence of maltreatment in FDRs of subjects with PG and controls

Type of childhood maltreatment	Predictor	Odds Ratio (95% confidence interval)	
		Model 1	Model 2
Emotional	Subject group (PG=1)	3.10 (1.57, 6.13)	2.22 (1.09, 4.52)
	Maltreatment status		2.21 (1.08, 4.51)
Neglect	Subject group (PG=1)	8.77 (2.52, 30.50)	6.60 (1.96, 22.17)
	Maltreatment status		8.45 (2.09, 34.14)
Physical	Subject group (PG=1)	2.47 (1.21, 5.04)	2.25 (1.13, 4.49)
	Maltreatment status		1.68 (0.74, 3.83)
Verbal	Subject group (PG=1)	2.93 (1.62, 5.29)	1.93 (1.10, 3.40)
	Maltreatment status		3.29 (1.90, 5.67)
Sexual	Subject group (PG=1)	0.99 (0.41, 2.39)	0.66 (0.28, 1.57)
	Maltreatment status		4.05 (1.59, 10.34)
Any type of maltreatment	Subject group (PG=1)	2.16 (1.23, 3.80)	1.50 (0.83, 2.71)
	Maltreatment status		2.69 (1.52, 4.77)

GEE = generalized estimating equations, covariates include sex, relationship to subject, subject's years of education, and subject's sex.