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Tobacco Use and Pathological Gambling

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Background. *Evidence supports phenomenological, clinical, epidemiological and biological links between problem/pathological gambling and tobacco use. An improved understanding of the relationship would be helpful in treating individuals with co-occurring pathological gambling and nicotine dependence.*

Methods. *This study investigates the tobacco use behaviors of 225 adults (mean age SD = 47.3 11.0 years; number of women = 120 [53.3%]) who were recruited for pharmacological treatment of pathological gambling. All subjects met criteria for pathological gambling based upon the Structured Clinical Interview for Pathological Gambling (SCI-PG), a DSM-IV-based diagnostic interview, and were assessed at baseline with multiple reliable and valid measures of gambling severity.*

Results. *159 (70.7%) subjects were either current (n = 110; 48.9%) or prior daily smokers (n = 49; 21.8%). Compared with the group of never smokers, the group of current and prior daily smokers was more likely to be older (F = 3.55; df = 2, 222; p = 0.030), be female (chi square = 10.85; df = 2; p = 0.004), and have stronger urges to gamble (F = 128.15; df = 2,222; p < 0.001).*

Conclusions. *Daily tobacco use in treatment-seeking pathological gamblers is common and associated with more severe urges to gamble. Treatments targeting urges in individuals with pathological gambling and current or prior daily tobacco use should be examined.*

Keywords Pathological gambling, Nicotine, Tobacco, Impulse control disorders, Urges/cravings

INTRODUCTION

Mounting evidence supports phenomenological, clinical, epidemiological and biological links between problem/pathological gambling and drug addictions, including tobacco use (1–3). Given the high rates of tobacco use in individuals who gamble excessively (1,4) and the adverse long-term effects of tobacco smoking, an improved understanding of the relationship between problem/pathological gambling and tobacco use has significant clinical implications.

Several studies have examined the rates and correlates of tobacco use among problem/pathological gamblers (1,2,5,6). Rates of daily tobacco use among problem/pathological gamblers have varied from 41% to 69% (4–6). Studies also suggest that tobacco use in problem/pathological gamblers is associated with both more severe substance use problems (2,3) and more severe gambling problems in some (2) but not other (3) studies.

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The current investigation systematically examines tobacco use in a large sample of subjects meeting DSM-IV criteria for pathological gambling (PG) (7). Subjects were systematically assessed for co-occurring Axis I use disorders and gambling symptom severity using structured measures. Given the results of prior studies, we hypothesized that pathological gamblers who were current or prior daily smokers would have more extensive gambling problems. Because tobacco use may be characterized as an urge-driven behavior, we hypothesized that pathological gamblers with current or past daily use of tobacco would have more severe gambling urges.

METHODS

Subjects

The subjects were male and female outpatients aged 18 years and older who met DSM-IV criteria for a principal diagnosis of PG (7). Patients were recruited by newspaper advertisements and by referrals for medication treatment or

pharmacological studies (8–10). The Institutional Review Board of the University of Minnesota approved the studies and the consent statements for the various pharmacological studies. All study participants provided written informed consent. All subjects, including those not suitable for inclusion in pharmacological studies, were assessed by the first author as described below. For purposes of assessing tobacco use, all subjects who met DSM-IV criteria for PG were included in the present study.

Assessments

All subjects were administered the Structured Clinical Interview for DSM-IV (SCID) (11) to assess psychiatric diagnoses. All subjects met criteria for PG based upon the Structured Clinical Interview for Pathological Gambling (SCI-PG), a clinician-administered, DSM-IV-based diagnostic interview that is compatible with the SCID and assesses both the ten inclusion criteria and the exclusionary criterion of PG: "not better accounted for by a Manic Episode." The SCI-PG has demonstrated excellent reliability, validity and classification accuracy in preliminary testing of individuals with gambling problems (12).

Because the SCID does not include modules for impulse control disorders, all subjects were screened with the Minnesota Impulsive Disorders Interview (13), a semistructured clinical interview for the following disorders: trichotillomania, pyromania, intermittent explosive disorder, kleptomania, compulsive buying, compulsive sexual behavior, and compulsive exercise.

Subjects' gambling severity was assessed with the Yale-Brown Obsessive Compulsive Scale Modified for Pathological Gambling (PG-YBOCS) (14). The PG-YBOCS is a reliable and valid semistructured 10-item scale assessing current PG symptoms. Items are rated on a scale of 0 (no symptoms) to 4 (extreme symptoms). Gambling urges were assessed using the Gambling Symptom Assessment Scale (G-SAS) (8), a reliable and valid 12-item self-report measure of past-week gambling urges, thoughts, and behavior along a scale from 0 (no symptoms) to 4 (extreme symptoms). The first three items of the G-SAS examine the frequency, intensity, and the duration of gambling urges.

The Global Assessment of Functioning (GAF) scale (15) was employed to measure global symptom severity and psychological, social, and occupational functioning. Lower scores denote more severe illness and poorer overall functioning. The GAF takes account of co-occurring disorders and other health issues and is not limited to gambling symptoms.

The SCID was not used to assess tobacco use. Instead, all subjects were asked about tobacco use using a semistructured clinical interview. Subjects were assessed for current or past tobacco use (cigars, cigarettes, pipe) with the following questions: "Do you smoke daily? If not, did you ever smoke daily? How many cigarettes do you smoke daily, on average? How many cigarettes did you smoke daily on average when you did smoke?"

Statistical Analysis

Subjects were assigned to one of three categories based on tobacco use history: never smoked daily, smoked daily in the past, smokes daily currently. Between-group differences were tested using the Pearson chi-square and 2-sided Fisher exact test for categorical variables and 2-tailed independent sample t-tests for continuous variables. Analysis of variance was used to examine the group differences between mean scores on the various assessments. Evaluations of gambling severity were adjusted for age and gender as these variables differed between groups. Because multiple pairwise comparisons were made, a Bonferroni correction was used: results which are statistically significant are associated with $p \leq 0.008$.

RESULTS

Two hundred and twenty five subjects (mean age ± SD = 47.3 ± 11.0 years [range 21 – 73 years]; male: n = 105 [46.7%]; female: n = 120 [53.3%]) were assessed. One hundred fifty nine subjects (70.7%) were either current (n = 110; 48.9% of total sample; 69.2% of lifetime daily smokers) or prior daily smokers (n = 49; 21.8% of total sample; 30.8% of lifetime daily smokers). Sixty-six (29.3%) subjects had never smoked tobacco daily. Of the 159 subjects who had smoked daily at some time in their lives, the maximal mean number of cigarettes smoked regularly on a daily basis was 24.2 ± 10.5.

A greater percentage of women comprised the group of current and prior daily smokers (X^2 = 10.85; df = 2; p = 0.004), with similar proportions of women in the current and prior smoking groups (60.9% and 59.2%, respectively). The subjects who reported no history of daily smoking were younger (44.4 ± 12.3 years) than those who currently smoked (48.0 ± 9.5 years) or had smoked in the past (49.4 ± 11.9 years; F = 3.55; df = 2,222; p = 0.030). There were no significant differences in other demographic features (Table 1).

Clinical gambling characteristics of subjects stratified by smoking status are presented (Table 2). Subjects with past or current daily tobacco use reported significantly greater intensity of urges associated with gambling as measured by item #1 on the G-SAS: "If you had unwanted urges to gamble during the past week, on average, how strong were your urges?" (F = 128.15; df = 2,222; p = <0.001). Overall gambling severity and social and occupational functioning were similar between groups. High rates of co-occurring Axis I disorders (including major depressive disorder, non-tobacco substance use disorders, and non-gambling impulse control disorders) were observed in all groups of pathological gamblers stratified by

Table 1 Demographics of Pathological Gamblers Grouped By Tobacco Use

Characteristic	Never Daily Smokers (N = 66)	Prior Daily Smokers (N = 49)	Current Daily Smokers (N = 110)	Statistic	df	p-value
Age						
Mean[a] (± SD)	44.4 (12.3)	49.4 (11.9)	48.0 (9.5)	3.55[b]	2, 222	.030
Gender: n (%)						
Male	42 (63.6)	20 (40.8)	43 (39.1)	10.85[c]	2	.004
Female	24 (36.4)	29 (59.2)	67 (60.9)			
Marital status: n (%)						
Single	19 (28.8)	10 (20.4)	22 (20.0)	2.56[c]	4	.63
Married	36 (54.5)	28 (57.1)	62 (56.4)			
Divorced/ Separated/Widowed	11 (16.7)	11 (22.4)	26 (23.6)			
Race: n (%)						
Caucasian	65 (98.5)	49 (100)	103 (93.6)	5.14[c]	2	.077
Other	1 (1.5)	0 (.0)	7 (6.4)			
Education: n (%)						
High School	13 (19.7)	10 (20.4)	19 (17.3)	1.63[c]	4	.80
Some College	32 (48.5)	19 (38.8)	48 (43.6)			
College or Beyond	21 (31.8)	20 (40.8)	43 (39.1)			

[a]Bonferroni multiple pairwise comparisons.
p = .045 Never smoked vs. Smoked in the past.
p = .096 Never smoked vs. Currently smokes.
p = 1.0 Currently smokes vs. Smoked in the past.
[b]F (from Analysis of Variance).
[c]Chi-square.

Table 2 Symptom Severity in Pathological Gamblers Grouped By Tobacco Use

Characteristic	Never Daily Smokers (N = 66)	Prior Daily Smokers (N = 49)	Current Daily Smokers (N = 110)	Statistic	df	p-value
GAF						
Mean (±SD)	52.5 (7.4)	53.8 (9.1)	53.9 (8.9)	<1[a]	2, 222	.56
PG-YBOCS total score						
Mean (±SD)	25.8 (3.8)	26.7 (3.2)	26.4 (3.4)	1.21[a]	2, 222	.30
G-SAS total score						
Mean (±SD)	30.4 (6.3)	31.7 (6.8)	31.4 (6.3)	<1[a]	2, 222	.52
G-SAS urge score						
Mean[b] (±SD)	1.7 (0.6)	3.2 (0.6)	3.2 (0.6)	128.152[a]	2, 222	<.001

[a]F (from Analysis of Variance).
[b]Bonferroni multiple Pairwise comparisons.
p = <.001 Never smoked vs. Smoked in the past.
p = <.001 Never smoked vs. Currently smokes.
p = 1.0 Currently smokes vs. Smoked in the past.
GAF = Global Assessment of Functioning scale.
PG-YBOCS = Yale Brown Obsessive Compulsive Scale Modified for Pathological Gambling.
G-SAS = Gambling Symptom Assessment Scale.

smoking status, and no significant between-group differences were observed in rates of comorbidity (data not shown).

DISCUSSION

Current daily tobacco use in treatment-seeking pathological gamblers in this study (49%) appears higher than in the general population (25%) (16), and daily tobacco use was associated with more intense urges to gamble. We also observed a relatively large proportion of prior daily smokers. However, the proportion of prior as compared with current daily smokers (30.8% vs. 69.2%) is lower than the approximately 50%/50% rate observed in the general population (17). These findings suggest that, like individuals with other mental health disorders, it is more difficult for individuals with PG to quit smoking and that increased smoking cessation efforts are needed for these patients.

The observation of more intense urges to gamble in both current and prior daily smokers suggests that the relationship

reflects a trait rather than state characteristic. The finding of more intense gambling urges associated with tobacco use among pathological gamblers may have important treatment implications. In terms of pharmacological interventions, an opioid antagonist or bupropion may be appropriate for patients suffering from both problems. In a randomized clinical trial of the mu-opioid antagonist, naltrexone, in the treatment of PG, positive outcome was significantly greater for subjects reporting more intense urges to gamble (8). Similarly, in a study of smoking cessation, the addition of naltrexone to nicotine patch therapy resulted in a reduced desire to smoke (18). Given that both PG and tobacco use are generally defined as urge-driven behaviors (19), the finding that the co-occurrence of PG and daily smoking is associated with more severe urges to gamble may suggest a common pathophysiology in motivational circuitry (20). Therefore, clinicians may consider an opioid antagonist or bupropion for the treatment of pathological gamblers who report daily tobacco use. Bupropion effectively treats nicotine dependence (21), and emerging data suggest that bupropion may be efficacious and well-tolerated in the treatment of PG (22). Thus, the efficacy and tolerability of bupropion in the treatment of co-occurring PG and nicotine dependence warrant direct examination. Although selective serotonin reuptake inhibitors (SSRIs) have shown benefit for PG (23), their efficacy in the reduction of tobacco use is not substantial (24).

Multiple psychosocial treatments have also been investigated for both PG and tobacco use disorders. Cognitive-behavioral therapy, as well as brief interventions in the form of workbooks, have demonstrated success in randomized trials for PG (25–29). Similarly, cognitive-behavioral strategies have shown efficacy in reducing smoking behavior (30–33). Psychosocial interventions addressing both tobacco use and gambling, therefore, may be important considerations for patients with these co-occurring disorders.

Treatment of either PG or tobacco use could be complicated or compromised by the presence of the other untreated condition. Treating gambling alone may not be effective if the tobacco use is exerting a causal or maintaining influence on the treated condition. To our knowledge, no research has been published on the treatment of co-occurring tobacco use in patients with PG. Given the high rates of daily tobacco use in individuals with PG, research on effective treatments for PG patients with co-occurring tobacco use is needed.

This study has multiple limitations. First, the fact that subjects responded to advertisements for pharmacological treatment may have led to some bias with respect to subject selection. Second, subjects were categorized based on daily tobacco smoking. Subjects with current or past episodic use (e.g., “chipping”) or other forms of tobacco consumption (e.g., chewing) may not have been adequately captured by the semistructured interview, and therefore the relationship of these forms of tobacco use to gambling severity cannot be adequately addressed by this study. Third, treatment-seeking pathological gamblers may differ from individuals who do not seek treatment or have a less severe form of gambling addiction. The question, therefore, arises as to whether these results generalize to the larger population of problem/pathological gamblers.

In conclusion, the results suggest that tobacco use is common among subjects with PG. Given the adverse health measures associated with tobacco use, it is important that clinicians inquire about tobacco use in individuals with PG. Improved smoking cessation efforts appear important in individuals with PG. Moreover, as the presence of a current or prior history of tobacco use was associated with more severe gambling urges, this feature might be used to guide the development of more effective treatments. Further research, particularly prevalence and treatment studies involving larger samples, is needed to more effectively target smoking behaviors in people with pathological gambling.

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REFERENCES

1. Cunningham-Williams RM, Cottler LB, Compton III WM, Spitznagel EL: Taking chances: Problem gamblers and mental health disorders — results from the St. Louis Epidemiologic Catchment Area study. *Am J Public Health* 1998; 88:1093–1096
2. Petry NM, Oncken C: Cigarette smoking is associated with increased severity of gambling problems in treatment-seeking gamblers. *Addiction* 2002; 97:745–753
3. Potenza MN, Steinberg MA, McLaughlin SD, Wu R, Rounsaville BJ, Krishnan-Sarin S, George TP, O’Malley SS: Characteristics of tobacco-smoking problem gamblers calling a gambling helpline. *Am J Addictions* 2004:13;471–493
4. Crockford DN, el-Guebaly N: Psychiatric comorbidity in pathological gambling: A critical review. *Can J Psychiatry* 1998; 43:43–50
5. Smart RG, Ferris J: Alcohol, drugs and gambling in the Ontario adult population. *Can J Psychiatry* 1996; 41:36–45
6. Stinchfield R, Winters K: Effectiveness of Six State-Supported Compulsive Gambling Treatment Programs in Minnesota. St Paul: Compulsive Gambling Program. Mental Health Division, Minnesota Department of Human Services, 1996
7. American Psychiatric Association Committee on Nomenclature and Statistics: *In Diagnostic and Statistical Manual of Mental Disorders, (4th Ed.— Text Revision).* Washington, DC: American Psychiatric Association, 2000
8. Kim SW, Grant JE, Adson DE, Shin YC: Double-blind naltrexone and placebo comparison study in the treatment of pathological gambling. *Biol Psychiatry* 2001; 49:914–921
9. Kim SW, Grant JE, Adson DE, Shin YC, Zaninelli R: A double-blind placebo-controlled study of the efficacy and safety of paroxetine in the treatment of pathological gambling. *J Clin Psychiatry* 2002; 63:501–507

10. Grant JE, Kim SW, Potenza MN, Blanco C, Ibanez A, Stevens LC, Zaninelli R: Paroxetine treatment of pathological gambling: A multi-center randomized controlled trial. *Int Clin Psychopharmacol* 2003; 18:243–249
11. First MB, Spitzer RL, Gibbon M, Williams JBW: *Structured Clinical Interview for DSM-IV-Patient Edition (SCID-I/P, Version 2.0)*. New York, NY: Biometrics Research Department, New York State Psychiatric Institute, 1995
12. Grant JE, Steinberg MA, Kim SW, Rounsaville BJ, Potenza MN: Preliminary validity and reliability testing of a structured clinical interview for pathological gambling (SCI-PG). *Psychiatry Res* 2004; 128:79–88
13. Christenson GA, Faber RJ, de Zwaan M, Raymond NC, Specker SM, Ekern MD, Mackenzie TB, Crosby RD, Crow SJ, Eckert ED, Mussel MP, Mitchell JE: Compulsive buying: Descriptive characteristics and psychiatric comorbidity. *J Clin Psychiatry* 1994; 55:5–11
14. Hollander E, DeCaria CM, Mari E, Wong CM, Mosovich S, Grossman R, Begaz T: Short-term single-blind fluvoxamine treatment of pathological gambling. *Am J Psychiatry* 1998; 155:1781–1783
15. Jones SH, Thornicroft G, Coffey M, Dunn G: A brief mental health outcome scale: Reliability and validity of the Global Assessment of Functioning. *Br J Psychiatry* 1995; 166:654–659
16. Centers for Disease Control: Cigarette smoking among adults — United States. *Morbidity and Mortality Weekly Report* 1999; 48:993–996
17. Work group on Nicotine Dependence: Practice guidelines for the treatment of patients with nicotine dependence. *Am J Psychiatry* 1996; 153(10s):1–31
18. Krishnan-Sarin S, Meandzija B, O'Malley S: Naltrexone and nicotine patch smoking cessation: A preliminary study. *Nicotine Tob Res* 2003; 5:851–857
19. Brody AL, Mandelkern MA, London ED, Childress AR, Lee GS, Bota RG, Ho ML, Saxena S, Baxter LR Jr, Madsen D, Jarvik ME: Brain metabolic changes during cigarette craving. *Arch Gen Psychiatry* 2002; 59:1162–1172
20. Chambers RA, Taylor JR, Potenza MN: Developmental neurocircuitry of motivation in adolescence: A critical period of addiction vulnerability. *Am J Psychiatry* 2003; 160:1041–1052
21. Hurt RD, Sachs DP, Glover ED, Offord KP, Johnston JA, Dale LC, Khayrallah MA, Schroeder DR, Glover PN, Sullivan CR, Croghan IT, Sullivan PM: A comparison of sustained-release bupropion and placebo for smoking cessation. *N Engl J Med* 1997; 337(17):1195–1202
22. Black DW: An open-label trial of bupropion in the treatment of pathologic gambling. *J Clin Psychopharmacol* 2004; 24:108–110
23. Grant JE, Potenza MN: Impulse control disorders: Clinical characteristics and pharmacological management. *Ann Clin Psychiatry* 2004; 16:27–34
24. Hughes JR, Stead LF, Lancaster T: Antidepressants for smoking cessation. *Cochrane Database Syst Rev* 2003; 2:CD000031
25. Dickerson M, Hinchy J, England LS: Minimal treatments and problem gamblers: A preliminary investigation. *J Gambling Stud* 1990; 6:87–102
26. Echeburua E, Baez C, Fernandez-Montalvo J: Comparative effectiveness of three therapeutic modalities in psychological treatment of pathological gambling: Long term outcome. *Behav Cog Psychother* 1996; 24:51–72
27. Hodgins DC, Currie SR, el-Guebaly N: Motivational enhancement and self-help treatments for problem gambling. *J Consult Clin Psychol* 2001; 69:50–57
28. Ladouceur R, Sylvain C, Boutin C, Lachine S, Doucette C, Leland J, Jacques C: Cognitive treatment of pathological gambling. *J Nerv Ment Dis* 2001; 189:774–780
29. Sylvain C, Ladouceur R, Boisvert JM: Cognitive and behavioral treatment of pathological gambling: A controlled study. *J Consult Clin Psychol* 2001; 65:727–732
30. Perkins KA, Marcus MD, Levine MD, D'Amico D, Miller A, Broge M, Ashcom J, Shiffman S: Cognitive-behavioral therapy to reduce weight concerns improves smoking cessation outcome in weight-concerned women. *J Consult Clin Psychol* 2001; 69:604–613
31. Sykes CM, Marks DF: Effectiveness of a cognitive behaviour therapy self-help programme for smokers in London, UK. *Health Promot Int* 2001; 16:255–260
32. Minneker-Hugel E, Unland H, Buchkremer G: Behavioral relapse prevention strategies in smoking cessation. *Int J Addict* 1992; 27:627–634
33. Lichtenstein E, Brown A: Current trends in the modification of cigarette dependence. In: Bellack A, Hersen H, Kazdin A, eds. *International Handbook of Behavior Modification and Therapy*. New York: Plenum, 1985:575–612