Suicide Attempts Among Veterans Seeking Treatment for Pathological Gambling

Otto Kausch, M.D.

Background: There is little information in the scientific literature regarding the suicide attempts of pathological gamblers, even though studies of problem gamblers have found that completed suicide, suicide attempts, and suicidal ideation are common outcomes related to gambling behavior. There has been no attempt in previous studies to identify the contributions of comorbid conditions, such as substance abuse, to the suicide attempts of pathological gamblers.

Method: A retrospective chart review was completed for all consecutive admissions (N = 114) to the Gambling Treatment Program of the Louis Stokes VA Medical Center over a 12-month period (September 2000–September 2001). All subjects met DSM-IV criteria for pathological gambling. Relevant information was obtained from the admission history and physical examination, as well as a variety of self-report questionnaires and structured instruments.

Results: Forty-five patients (39.5%) reported that they had made a suicide attempt at some time in their lives. The most common method was overdose. Sixty-four percent of attempters reported that their most recent attempt was related to gambling. Forty-two percent of gamblers with a history of alcohol dependence and 58.8% of those with a history of drug dependence had a history of suicide attempts. Mean impulsivity scores differentiated suicide attempters from nonattempters among gamblers with a history of drug and/or alcohol dependence. Severity of psychiatric symptoms and family problems on admission was related to a history of suicide attempts.

Conclusion: Pathological gamblers have high rates of attempted suicide. They are highly impulsive and suffer from high rates of comorbid psychiatric conditions as well as social disruptions. A combination of these risk factors very likely contributes to their potential for suicidal behavior.

(J Clin Psychiatry 2003;64:1031–1038)

Received Sept. 18, 2002; accepted March 17, 2003. From the Louis Stokes VA Medical Center, Brecksville Division, Veterans Addiction Recovery Center (VARC), Brecksville, Ohio.

Dr. Kausch reports no financial affiliation or other relationship relevant to the subject matter of this article.

The author thanks Richard McCormick, Ph.D., and Alex Pokorny, M.D., for reviewing earlier versions of this manuscript.

Corresponding author and reprints: Otto Kausch, M.D., Louis Stokes VA Medical Center, Brecksville Division, Veterans Addiction Recovery Center (VARC), 10000 Brecksville Road, Brecksville, OH 44141 (e-mail: Otto.Kausch@med.va.gov).

Studies of problem gamblers have found that completed suicide, suicide attempts, and suicidal ideation are common outcomes related to gambling behavior. Blaszczynski and Farrell[1] reported 44 completed suicides in Australia between 1990 and 1997 in which the State Coroner identified the presence of a gambling problem linked to the suicide. In reviewing their cases, Blaszczynski and Farrell found that a third of the individuals had previously attempted suicide. This rate is comparable to that of suicide attempts among suicide completers in general. Approximately 30% to 40% of suicide completers have made at least 1 prior suicide attempt.[2]

Although the characteristics of suicide attempts and attempters in the general population and in various subpopulations of psychiatric patients have been studied, thus far the scientific literature on the characteristics of suicide attempts and attempters among problem gamblers is limited. In a national sample of 162 members of Gamblers Anonymous, Frank and colleagues[3] found that 48% had thought about suicide and 13% had attempted suicide. McCormick et al.[4] found in their study of 50 pathological gamblers admitted to the Brecksville Veterans Administration Gambling Treatment Program that 12% had made a lethal suicide attempt in the year before hospitalization, and another 12% had "mentally rehearsed a specific plan or made a suicidal gesture." Similar studies in New Zealand, the United Kingdom, Germany, and Canada have found rates of attempted suicide ranging from 4% to 37% among gamblers.[5–8] This compares with an approximate lifetime U.S. general population suicide attempt rate of 1.1% to 4.6%[9] and an international lifetime rate of 0.72% to 5.93%.[10] However, it is worth noting that more suicide attempts in the United States (as well as internationally) are made by women,[11] whereas most problem gamblers are men. Thus, comparing suicide attempt rates between problem gamblers and the general population is difficult.

Many of the reports of suicide attempts among problem gamblers have serious methodological difficulties, and little information is provided other than simple rates. Thus far, there has been little systematic effort to study the characteristics of suicide attempts and attempters among pathological gamblers.

Pathological gamblers frequently suffer from comorbid psychiatric conditions, most notably substance abuse

disorders[12] and affective disorders.[4] One of the major problems in the published reports of suicide attempts among pathological gamblers is that there has been no attempt to identify to what extent the attempt was related to gambling versus the underlying comorbid conditions from which many pathological gamblers suffer. Alcoholism is associated independently with a high rate of suicide attempts, with rates typically between 17% and 29%.[13–17] Depressive disorders and mood disorders in general are also associated with elevated rates of suicide attempts.[9]

In the present study, we provide descriptive information about suicide attempts of pathological gamblers as well as some underlying characteristics of the attempters. We also perform comparisons with gamblers who have not made suicide attempts.

METHOD

A retrospective chart review was initiated for all consecutive admissions to the Gambling Treatment Program of the Louis Stokes Veterans Administration Medical Center (VAMC) for 12 months between September 2000 and September 2001. The Brecksville VAMC Gambling Treatment Program is a residential 30-day program that serves veterans from all states in the United States, and on average 115 patients are admitted per year. On admission, a history and physical examination are performed and a battery of psychological tests is administered. The admitting physician diagnoses psychiatric disorders based on clinical presentation and history provided by the patient. The vast majority of gamblers are admitted from a waiting list, and their psychiatric conditions have been stabilized before they present for gambling treatment.

Questionnaires include the South Oaks Gambling Screen (SOGS),[18] the most commonly used instrument for assessing pathological gambling. Scores above 5 are consistent with a diagnosis of pathological gambling. The Barratt Impulsivity Scale (BIS-10)[19] is a self-report questionnaire that measures overall impulsiveness as well as 3 subscales of impulsivity: motor, cognitive, and nonplanning impulsiveness. It has been shown to be a reliable and valid instrument and has been used with gambling and substance abuse populations. All items are answered on a 4-point scale, on which 4 indicates the most impulsive response. In a baseline study,[20] mean total scores for male undergraduates were 65; for substance-abuse patients, 69; for general psychiatric patients, 70; and for prison inmates, 76. The Gambler's Self-Report Inventory (GSRI) is an extensive self-report questionnaire that asks many questions about gambling behavior as well as about other items of clinical interest such as prior suicide attempts (H. R. Lesieur, Ph.D., R. J. Rosenthal, M.D., unpublished scale, 1995).

Structured interviews included the Addiction Severity Index (ASI),[21] a reliable, valid, and sensitive measure of problem severity in 7 domains for the 30-day period preceding the interview, with higher scores indicating greater problems. The 7 domains are medical, employment, alcohol, drug, legal, family/social, and psychiatric. The severity ratings in our study represent those of the interviewer, rather than patient self-report. During the ASI interview, detailed information is also obtained concerning psychiatric, substance abuse, and psychosocial history. The substance abuse portion of the Structured Clinical Interview for DSM-IV (SCID-CV)[22] is administered, which determines whether the subject meets DSM-IV criteria for a lifetime history of drug or alcohol abuse or dependence and also determines the actual drugs of abuse. The SCID-CV and ASI are administered by trained and experienced clinicians. In addition to scoring greater than 5 on the SOGS, all gamblers admitted to the treatment program specifically meet DSM-IV[23] diagnostic criteria for pathological gambling.

Basic demographic information is available from the admission database. Information from the SCID-CV and ASI allows us to diagnose lifetime history of alcohol abuse/dependence, as well as identify the specific drugs of abuse/dependence. A review of the ASI as well as of admission history and physical examination allows us to determine the length of time that gamblers have abused substances and when the substance was last used. In the GSRI, the patients are asked whether they have ever made a suicide attempt, the method used, and when the last attempt occurred as well as whether the most recent attempt was related to gambling problems. This information is often also obtained in the admission history and physical examination, as well as in the ASI. Psychiatric diagnoses are made by the admitting physician on the basis of the history and clinical presentation at admission. The psychiatrist with the gambling team is most commonly the admitting physician. As part of the psychiatric history, patients are asked if they have ever had a psychiatric admission, the number of admissions, and when the last admission occurred.

Descriptive frequencies, means, and percentages were computed and compared for the variables of interest. Further statistical analyses were performed using GraphPad InStat, version 3.05.[24] When comparing mean ages, the Mann-Whitney test was used. The Mann-Whitney test was also used for comparing length of problem gambling between those with and without a suicide attempt. In comparisons involving rates of those with and without suicide attempts and those with and without a history of substance abuse, Fisher exact test was used. Unpaired t tests were used to compare BIS-10 scores and ASI severity scores. We assumed populations with equal standard deviations. We utilized the method of Kolmogorov and Smirnov[24] to test for Gaussian distributions. We utilized 2-tailed p values throughout.

Table 1. Characteristics of Suicide Attempters Compared With Nonattempters

Characteristic	Suicide Attempters N	Suicide Attempters %	Nonattempters N	Nonattempters %	p Value[a]
General demographic data					
Gender[b]					.513
Male	40	88.9	64	92.8	
Female	5	11.1	5	7.2	
Race[b]					.361
White	40	88.9	58	84.1	
African American	5	11.1	8	11.6	
Native American	0	0	3	4.3	
Highest level of education[c]					.220
Less than high school	4	9.1	3	4.3	
Completed high school	11	25.0	27	39.1	
Some college	22	50.0	35	50.7	
College graduate	4	9.1	3	4.3	
Advanced degree	3	6.8	1	1.4	
Lifetime history of substance abuse/dependence[d]					
Alcohol dependence	20	44.4	28	41.2	.376
Drug dependence	20	44.4	14	20.6	.032
Polysubstance dependence (history of both alcohol and drug dependence)	12	26.7	12	17.6	.185
Any substance abuse/dependence	33	73.3	42	61.8	.228

[a]Comparisons made using the Fisher exact test, except that for race, which was made using chi-square analysis.
[b]For suicide attempters, total N = 45; for nonattempters, total N = 69.
[c]For suicide attempters, total N = 44; for nonattempters, total N = 69.
[d]For suicide attempters, total N = 45; for nonattempters, total N = 68.

Table 2. Characteristics of Suicide Attempts and Attempters

Characteristic	N	%
Number of attempts (N = 45)		
1	20	44.4
2	17	37.8
3 or more	8	17.8
Most recent attempt related to gambling (N = 42)		
Yes	27	64.3
No	15	35.7
Most recent attempt before admission (N = 38)		
< 6 mo	8	21.1
6 mo to 1 y	7	18.4
> 1–5 y	7	18.4
> 5 y	16	42.1
Age at most recent suicide attempt, y (N = 38)		
Teens	2	5.3
20–29	9	23.7
30–39	6	15.8
40–49	11	28.9
50–59	9	23.7
60–69	1	2.6
Method of most recent attempt (N = 44)		
Overdose	23	52.3
Carbon monoxide	5	11.4
Gun	4	9.1
Other[a]	12	27.3

[a]Includes hanging, car crash, electrocution, jumping, shooting by police, and wrist-cutting.

RESULTS

During the year of the study, there were 115 admissions to the Gambling Treatment Program. Of these 115 consecutively admitted patients, information about suicide attempts and most related factors was available for 114 (there was no information about suicide attempt history for 1 man; see Table 1). By far, most of the patients admitted were white men, the majority of whom were in their 40s and 50s. The mean (SD) age for the sample was 48.9 (9.7) years (range, 25–69 years). The mean age for men was 49.0 (9.9) years (range, 25–69 years) and for women was 48.1 (7.9) years (range, 37–67 years). The mean (SD) duration of problem gambling for the sample was 18 (13) years (range, 9 months–50 years). Fifty-nine percent of the sample had a history of problem gambling greater than 10 years, while 18.6% reported having a gambling problem less than 5 years. When comparing the duration of problem gambling between suicide attempters and nonattempters, the mean duration was not significantly different.

Forty-five patients (39.5%) reported that they had made a suicide attempt at some time in their lives (Table 2). Thirty-eight percent of men and half of women had made a suicide attempt. The difference in rates was not statistically significant (p = .51). The most common method of attempts was overdose (52.3%) (see Table 2). The second most common was carbon monoxide poisoning (11.4%). Other methods included use of a gun, hanging, car crash, electrocution, jumping, shooting by police, and wrist-cutting. Forty-four percent of the attempters had made only 1 attempt. Fifty-six percent of attempters had made 2 or more attempts. Forty percent of suicide attempters made their most recent attempt within 1 year before admission to our program. Forty-two percent made their most recent attempt more than 5 years prior to admission.

The mean (SD) age of male attempters was 41 (13) years at the time of their most recent attempt (range, 19–69 years), and the mean age of female attempters was 36 (12) years at the time of their most recent attempt (range, 18–45 years). The difference between genders was not statistically significant (p = .47). The mean age of attempters at the time of their last attempt who reported that their attempt was related to gambling was 45 (11) years (range, 23–69 years). For those who reported that their last attempt was not related to gambling, the mean age was 33 (13) years at the time of their last attempt (range, 18–58 years). The difference was significant (p = .004). The peak years for suicide attempters in the general population are the early 20s,[11] so the gamblers who most recently attempted suicide were substantially older than attempters in the general population, especially if the attempt was related to gambling.

The gamblers in our study had a high rate of comorbid substance abuse problems, and we analyzed suicide at-

Table 3. Primary Clinical Diagnoses of Suicide Attempters and Nonattempters[a]

Diagnosis	Suicide Attempters (N = 44) N	%	Nonattempters (N = 69) N	%	p Value[b]
Depressive disorder	23	52.3	25	36.2	.126
Bipolar disorder	5	11.4	3	4.4	.261
Schizophrenia and schizoaffective disorder	4	9.1	2	2.9	.211
Adjustment disorder	5	11.4	13	18.8	.306
Primary personality disorder	2	4.5	1	1.4	…
PTSD	3	6.8	3	4.3	.679
Substance-induced mood disorder	1	2.3	0	0	…
Anxiety disorder (non-PTSD)	1	2.3	1	1.4	…
Any psychiatric diagnosis	44	100	48	69.6	< .0001

[a]Diagnoses do not include substance abuse disorders.
[b]Fisher exact test.
Abbreviation: PTSD = posttraumatic stress disorder.

tempts in terms of lifetime history of substance abuse and dependence (Table 1). Sixty-seven gamblers (59.3%) had a history of alcohol abuse or dependence, 44 (38.6%) had a history of drug abuse or dependence, and a total of 75 (66.4%) had a history of some form of substance abuse or dependence. While studies of pathological gamblers have reported rates of suicide attempts and rates of substance abuse, we have found no previous studies that attempted to correlate the two.

Forty-two percent of gamblers with a history of alcohol dependence had a history of having made a suicide attempt, compared with 32% of those gamblers with no history of substance abuse problems. The difference was not statistically significant ($p = .38$). If we include those gamblers with a history of alcohol abuse in addition to dependence, the difference was still not significant ($p = .30$). Gamblers with a history of alcohol dependence were no more likely than those with both alcohol dependence and a drug history to have made a suicide attempt ($p = 1.00$). On the other hand, 58.8% of those with a history of drug dependence had a history of suicide attempts, compared with 32% of those without a history of substance problems, and the difference was statistically significant ($p = .03$). Those with a history of drug dependence were no more likely to have made multiple attempts versus 1 past attempt ($p = .5$). Among those with a history of drug problems, cannabis was the most common drug of abuse or dependence. Cocaine was the second most common drug of abuse or dependence. Other drugs included sedatives, stimulants, opioids, hallucinogens, and inhalants. Among those gamblers with a history of drug abuse, we found no significant difference between attempters and nonattempters in their choice of drugs.

Sixty-four percent of attempters reported that their most recent attempt was related to gambling (Table 2; information not available for 3 attempters), while 36% reported that their most recent attempt was not related to gambling. Sixty-three percent of those who reported that their suicide attempt was related to gambling had a history of substance abuse or dependence. Of those who reported that their suicide attempt was not related to gambling, 93.3% had a history of substance abuse or dependence. The difference in rates reached a significance of $p = .06$. All but 1 of the 11 subjects with no history of substance abuse problems who had made a suicide attempt reported that their most recent attempt was related to gambling; that 1 subject, a woman, had a history of 40 psychiatric admissions due to problems with depression.

Altogether, 81% of gamblers were given a clinical psychiatric diagnosis on admission, exclusive of substance abuse disorders (Table 3). Only 8 (7%) of 114 gamblers had no psychiatric diagnosis and no history of substance abuse problems. Seventy percent of nonattempters and essentially 100% of suicide attempters had a psychiatric diagnosis (Table 3; there was no diagnostic information about 1 female suicide attempter). Thus, gamblers with any psychiatric diagnosis were significantly more likely to have made a suicide attempt in the past than those without a psychiatric diagnosis ($p < .0001$). Yet, there were no significant differences between suicide attempters and nonattempters within any one diagnostic group, including depressive disorders.

Fifty-four patients (47.4%) had a history of acute psychiatric admissions. Information was not obtained about whether or not gambling problems were a factor precipitating these psychiatric admissions. Of those gamblers with a history of suicide attempts, 73.3% had a history of acute psychiatric admissions (all but 1 with multiple admissions). Of those without a history of suicide attempts, only 30.4% had a history of psychiatric admissions. The difference in rates was significant ($p < .0001$). Those gamblers with a history of 2 or more psychiatric admissions were significantly more likely than those with only 1 or 2 admissions to have made a suicide attempt ($p = .03$). Of those gamblers with a history of substance abuse, 54.1% had a history of an acute psychiatric admission, compared with 32.5% of those without a history of substance problems. The difference in rates reached a significance of $p = .07$.

When we examined the ASI severity scores of suicide attempters and nonattempters (Table 4), we found that a history of suicide attempts was significantly related to severity of psychiatric symptoms and also to family problems on admission to gambling treatment. There was a trend toward an association with severity of legal problems. There was no significant relationship between a history of suicide attempts and severity of medical, employment, alcohol, or drug problems on admission.

Table 4. Test Scores for Suicide Attempters (N = 45) Versus Nonattempters (N = 69)

Measure	Suicide Attempters Mean	SD	Nonattempters Mean	SD	Analysis[a] t	df	p Value
ASI							
Medical	3.09	2.21	2.40	2.22	1.61	109	.110
Employment	1.26	1.80	1.25	1.76	0.02	109	.987
Alcohol	2.09	2.06	1.52	1.88	1.52	109	.131
Drug	1.35	2.11	1.06	1.73	0.79	109	.432
Legal	0.93	1.58	0.46	1.26	1.75	109	.083
Family/social	4.00	1.73	3.19	2.18	2.06	109	.042
Psychiatric	4.35	1.43	2.85	1.93	4.37	109	< .0001
BIS-10							
All subjects							
Total	70.9	15.5	65.3	16.5	1.73	99	.088
IC	23.1	8.1	21.2	6.9	1.32	99	.190
IM	21.3	6.9	19.2	7.4	1.41	99	.162
INP	27.0	5.1	25.2	5.8	1.71	99	.090
Gamblers with a history of alcohol dependence							
Total	73.7	11.0	64.9	14.3	2.16	42	.037
IC	25.5	7.1	20.8	5.5	2.47	42	.018
IM	21.4	5.2	19.5	6.8	1.00	42	.325
INP	27.9	4.4	25.0	5.9	1.77	42	.085
Gamblers with a history of drug dependence							
Total	77.3	13.0	64.2	13.5	2.70	28	.012
IC	26.7	6.1	19.5	4.5	3.54	28	.001
IM	21.9	5.4	18.7	7.9	1.34	28	.193
INP	29.9	4.1	25.9	6.0	2.14	28	.041

[a]Unpaired t tests assuming equal standard deviations and assuming Gaussian distributions using the method of Kolmogorov and Smirnov.[24]

Abbreviations: ASI = Addiction Severity Index, BIS-10 = Barratt Impulsivity Scale, IC = cognitive subscale, IM = motor subscale, INP = nonplanning impulsiveness subscale.

We examined BIS-10 impulsivity scores for the gamblers (Table 4). A comparison of the mean total impulsivity scores of gamblers with a history of suicide attempts and the mean scores of gamblers without a history of suicide attempts achieved only a significance level of p = .09. The mean total impulsivity scores of gamblers with a history of alcohol dependence were not significantly different from those of gamblers with a history of drug dependence (p = .32) or those of gamblers with no history of substance abuse or dependence (p = .62). As well, the mean total impulsivity scores of gamblers with a history of drug dependence were not significantly different from those with no history of substance abuse or dependence (p = .24). However, there was a difference in mean total impulsivity scores when comparing gamblers with a history of drug and alcohol dependence in terms of whether or not they had made a suicide attempt.

The mean total impulsivity scores of gamblers with a history of alcohol dependence who had made a suicide attempt were not significantly different from the mean total impulsivity scores of those gamblers with a history of drug dependence who had made a suicide attempt (p = .38). However, the mean total impulsivity scores of those gamblers with a history of alcohol dependence who had made a suicide attempt were significantly higher than those of gamblers with a history of alcohol dependence who had not made a suicide attempt (p = .04), and specifically the IC, or cognitive, impulsiveness subscale contributed to this difference. Similarly, the mean total impulsivity scores of gamblers with a history of drug dependence who had made a suicide attempt were significantly higher than the mean impulsivity scores of gamblers with a history of drug dependence but no suicide attempts (p = .01), and both the IC, or cognitive, and INP, or nonplanning, subscales contributed to this difference.

DISCUSSION

We found that among our sample of 114 consecutively admitted pathological gamblers, 39.5% had made at least 1 suicide attempt in the past. This percentage is greater than the 17% rate for a sample of 186 pathological gamblers admitted to a private hospital in the United States[25] and the 22% rate for a sample of 45 pathological gamblers admitted to a private hospital in Spain,[26] but comparable to the 36.7% rate of a German sample of 58 pathological gamblers admitted to a residential treatment program.[7] McCormick and colleagues,[4] reporting on the same treatment program as ours at the Brecksville VA Hospital almost 20 years ago, stated that 12% of a sample of 50 male pathological gamblers had made a suicide attempt in the year before admission. Among our sample of gamblers, 13.9% (15/108; no information on 6) reported having made a suicide attempt within a year of admission, a rate that is comparable to that noted previously by McCormick and colleagues. It is worth noting, however, that our sample is older on average than the other samples (48.9 years vs. 38 years for the Ciarrocchi and Richardson[25] sample, 42 years for the McCormick et al.[4] sample, 41 years for the Ibanez et al.[26] sample, and 32 years for the Schwartz and Lindner[7] sample). The gender distribution also varies to a small extent. Our sample was 91.2% male, the McComick et al. and the Schwartz and Lindner samples were all male, the Ciarrocchi and Richardson sample was 92% male, and the Ibanez et al. sample was 89% male.

The lifetime suicide attempt rate for our sample was higher than the lifetime attempt rates reported for Gamblers Anonymous samples over the years in various countries, which have ranged from 8% to 21%.[3,6,27,28] Perhaps this is because residential treatment samples represent a more psychiatrically impaired group of patients. As opposed to treatment samples, 2 Canadian community studies involving relatively small numbers of pathological gamblers reported a history of attempted suicide among 26.8% of 41 college students with pathological gambling[29] and 13.3% of 30 randomly selected household respondents with pathological gambling.[8] A U.S. commu-

nity sample from the St. Louis catchment area found that only 2% of 161 "problem gamblers" had a history of suicidal thoughts or attempts.[30]

Sixty-four percent of our gambling sample reported that their most recent suicide attempt was related to gambling. It is of interest that in the other studies in which this relationship is reported, virtually all of the gamblers reported that their suicide attempts were related to gambling.[6,7,26,27] It seems likely that the suicide attempts of the 36% of our gambling sample in which the attempt was not related to gambling were due to the gamblers' comorbid conditions, since all of those gamblers had an affective disorder or schizophrenic disorder, and all but 1 had a history of alcohol or drug dependence or, most commonly, both. Of the gamblers with no history of substance abuse problems who had made a suicide attempt (N = 11), all but 1 woman reported that their most recent attempt was related to gambling. This 1 woman had a history of 40 psychiatric admissions due to problems with depression. Also, of those gamblers who reported that their most recent suicide attempt was not related to gambling (N = 15), 73.3% had a history of acute psychiatric admissions, all but 1 with multiple admissions, which suggests a history of chronic mental health problems.

The majority of suicide attempters reported that their most recent attempt was by overdose. This is of interest because most of the attempters in our sample are white men. In the United States, only 4% of white males who commit suicide do so by overdose, whereas 18% of white females who commit suicide do so.[2] Both in this country and internationally, most suicide attempts are by means of overdose of medications, although, as noted previously, most attempters are younger females,[11] whereas most of our sample are older males.

In a study of suicide attempters in Finland, Suominen and colleagues[31] found high rates of alcohol dependence, but not alcohol abuse or other substance dependence or abuse among the males in their sample. Yet, we found that our predominantly male sample of gamblers with a history of alcohol dependence were not more likely to have made a suicide attempt. Whitters et al.[17] and Roy et al.[15] found that alcoholics with a history of drug abuse were more likely to have attempted suicide. Yet, in our sample, we found that those gamblers with a history of both alcohol dependence and drug abuse or dependence were no more likely than gamblers with only an alcohol dependence history to have made a suicide attempt. What we did find was that gamblers with a history of drug dependence were more likely to have made a suicide attempt than those gamblers without a history of substance abuse problems. One could hypothesize that perhaps gamblers with a history of drug dependence are more impulsive and therefore more at risk for suicide attempts. Yet, as we noted in the Results section, the mean total BIS-10 impulsivity score of gamblers with a history of drug dependence was not significantly different from that of gamblers with a history of alcohol dependence or of gamblers with no history of substance problems. It is unclear at this point why drug-dependent gamblers are at higher risk for suicide attempts. This is an area for future research.

In addition to their findings relating to substance abuse and suicide attempts, Suominen and colleagues[31] noted that comorbidity in general appeared to play an important role in suicide attempts. This finding of comorbidity has been noted by a number of other authors studying suicide attempts among those with drug and alcohol problems.[15,17,31,32] It is striking that 93% of gamblers in our sample were noted to have some combination of psychiatric and substance abuse diagnoses in addition to pathological gambling, that virtually all of the suicide attempters carried an Axis I psychiatric diagnosis on admission, and that 73% of attempters had some history of substance abuse problems. It is likely that these factors contributed to the high rate of suicide attempts in our sample. Yet, it is also noteworthy that a history of suicide attempts among gamblers was not related to having any particular psychiatric diagnosis, including depression.

A history of suicide attempts was related to severity of psychiatric symptoms and family and social problems on admission to the gambling program, as measured by the ASI. Although only 21% of suicide attempters made their attempt within 6 months prior to admission to the gambling program, the ASI severity scores give a general indication of the person's level of functioning at a time when he or she is under a great deal of stress due to the problems caused by gambling behavior. Their level of functioning prior to admission is most likely similar to previous times of high stress that culminated in suicidal behavior. It is not surprising that severity of psychiatric symptoms and family problems is related to suicidal behavior in gamblers, since these factors have been related to suicidality in other populations.[16,17]

Impulsivity appears to play a role in the suicide attempts of pathological gamblers with substance abuse histories. In a review, Brady et al.[33] noted that higher rates of substance abuse or dependence were found in impulsively violent offenders than in the general population. Many studies have found elevated levels of impulsivity when comparing substance abusers with controls (see Moeller et al.[34]). Of interest, in a study comparing both treatment-seeking cocaine-dependent patients[32] and opiate-dependent patients[35] who had attempted suicide with patients who had never attempted suicide, Roy found no difference in Barratt impulsivity scores. The evidence is also mixed regarding levels of impulsivity in gamblers versus controls (see Petry[36]). Comparing substance abusers with and without gambling problems, McCormick[37] found that those substance abusers with gambling problems scored significantly higher on measures of impulsivity. Petry[36] found that the co-occurence of both substance

abuse and pathological gambling was associated with increased impulsiveness on a variety of behavioral and self-report measures when compared with non–substance-abusing gamblers and controls.

With respect to suicidality, several authors have found that impulsivity is correlated with suicide attempts.[38–40] Mann and colleagues[41] proposed a stress-diathesis model, in which the risk for suicidal acts is determined not merely by a stressor but also by a diathesis which may be reflected in tendencies of persons to be more impulsive, and therefore more likely to act on suicidal feelings.

In our sample, the mean impulsivity scores of gamblers with both a history of alcohol and drug dependence who had made suicide attempts was higher than the mean scores of gamblers without suicide attempts, and among the 3 subscales of the BIS-10, the cognitive and nonplanning subscales, rather than the motor subscale, tended to account for the relationship. The relationship between impulsivity and suicidality is complex and not well understood. Baca-García and colleagues[42] found an inverse relationship between impulsivity and lethality in suicide attempters. They suggested that further research was needed to study the complex relationship between impulsivity as a trait and impulsivity as a state, as well as how each is impacted by psychopathology, substance intoxication, and other environmental influences. Since pathological gamblers as a group are generally highly impulsive individuals and also highly suicidal, they represent a good group for further study of the relationship between impulsivity, the various components of impulsivity, and suicidal behavior.

There are a number of limitations to this study. Data were obtained from a retrospective chart review, rather than in a more controlled prospective way. Psychiatric diagnoses were not obtained in a structured and controlled manner. Due to the extensive Axis I and Axis II comorbidity among pathological gamblers, in a future study it would be helpful to utilize a full Axis I and Axis II (SCID) to help tease out the effects of gambling from conditions other than substance abuse in suicide attempts. Future studies might also examine the degree of suicidal intent and medical lethality of suicide attempts, neither of which was examined in this study.

CONCLUSION

Pathological gamblers have high rates of attempted suicide, which elevates their risk for eventually committing suicide. Those who treat pathological gamblers should assess for suicidal risk as a part of their assessments. Gamblers, especially those with comorbid substance abuse problems, are highly impulsive, and impulsivity is a risk factor for suicidal behavior. Treatment should include a focus on comorbid conditions, as well as helping pathological gamblers become less impulsive in their behavior.

REFERENCES

1. Blaszczynski A, Farrell E. A series of 44 completed gambling-related suicides. J Gambling Stud 1998;14:93–109
2. Maris RW, Berman AL, Silverman MM. Suicide attempts and methods. In: Comprehensive Textbook of Suicidology. New York, NY: The Guilford Press; 2000:284–308
3. Frank ML, Lester D, Wexler A. Suicidal behavior among members of Gamblers Anonymous. J Gambling Stud 1991;7:249–254
4. McCormick RA, Russo AM, Ramirez LF, et al. Affective disorders among pathological gamblers seeking treatment. Am J Psychiatry 1984;141:215–218
5. Sullivan S. Why compulsive gamblers are a high suicide risk. Community Ment Health N Z 1994;8:40–47
6. Moran J. Clinical and social aspects of risk-taking. Proc Royal Soc Med 1970;63:1273–1277
7. Schwartz J, Lindner A. Inpatient treatment of male pathological gamblers in Germany. J Gambling Stud 1992;8:93–109
8. Bland RC, Newman SC, Orn H, et al. Epidemiology of pathological gambling in Edmonton. Can J Psychiatry 1993;38:108–112
9. Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. Arch Gen Psychiatry 1999;56:617–626
10. Weissman MM, Bland RC, Canino GJ, et al. Prevalence of suicide ideation and suicide attempts in nine countries. Psychol Med 1999; 29:9–17
11. Weissman MM. The epidemiology of suicide attempts, 1960–1971. Arch Gen Psychiatry 1974;30:737–746
12. Ramirez LF, McCormick RA, Russo AM, et al. Patterns of substance abuse in pathological gamblers undergoing treatment. Addict Behav 1983;8:425–428
13. Schuckit MA. Primary men alcoholics with histories of suicide attempts. J Stud Alcohol 1986;47:78–81
14. Hesselbrock M, Hesselbrock V, Syzmanski K, et al. Suicide attempts and alcoholism. J Stud Alcohol 1988;49:436–442
15. Roy A, Lamparski D, DeJong J, et al. Characteristics of alcoholics who attempt suicide. Am J Psychiatry 1990;147:761–765
16. Hasin D, Grant B, Endicott J. Treated and untreated suicide attempts in substance abuse patients. J Nerv Mental Dis 1988;176:289–294
17. Whitters A, Cadoret R, Widmer R. Factors associated with suicide attempts in alcohol abusers. J Affect Disord 1985;9:19–23
18. Lesieur HR, Blume SB. The South Oaks Gambling Screen (The SOGS): a new instrument for the identification of pathological gamblers. Am J Psychiatry 1987;144:1184–1188
19. Barratt ES. Factor analysis of some psychometric measures of impulsiveness and anxiety. Psychol Rep 1965;16:547–554
20. Patton JH, Stanford MS, Barratt ES. Factor structure of the Barratt impulsiveness scale. J Clin Psychol 1995;51:768–774
21. McLellan AT, Kushner H, Metzger D, et al. The fifth edition of the Addiction Severity Index. J Subst Abuse Treat 1992;9:199-213
22. First MB, Spitzer RL, Gibbon M, et al. Structured Clinical Interview for DSM-IV Axis I Disorders, Clinician Version (SCID-CV). Washington, DC: American Psychiatric Press; 1996
23. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition. Washington, DC: American Psychiatric Association; 1994
24. GraphPad InStat version 3.05 for Windows. San Diego, Calif: GraphPad Software. Available at: www.graphpad.com. Accessed September 1, 2000
25. Ciarrocchi J, Richardson R. Profile of compulsive gamblers in treatment: update and comparisons. J Gambling Behav 1989;5:53–65
26. Ibanez AG, Mercade PV, Sanroma MA, et al. Clinical and behavioral evaluation of pathological gambling in Barcelona, Spain. J Gambling Stud 1992;8:299–310
27. Horodecki I. The treatment model of the guidance center for gamblers and their relatives in Vienna/Austria. J Gambling Stud 1992;8:115–129
28. Custer RL, Custer LF. Characteristics of the recovering compulsive gambler: a survey of 150 members of Gamblers Anonymous. Presented at the Fourth Annual Conference on Gambling; 1978; Reno, Nev
29. Ladouceur R, Dube D, Bujold A. Prevalence of pathological gambling and related problems among college students in the Quebec metropolitan area. Can J Psychiatry 1994;39:289–293
30. Cunningham-Williams RM, Cottler LB, Compton WM, et al. Taking chances: problem gamblers and mental health disorders. Results from the

St Louis Epidemiologic Catchment Area Study. Am J Pub Health 1998;88:1093–1096
31. Suominen K, Henriksson M, Suokas J, et al. Mental disorders and comorbidity in attempted suicide. Acta Psychiatr Scand 1996;94:234–240
32. Roy A. Characteristics of cocaine-dependent patients who attempt suicide. Am J Psychiatry 2001;158:1215–1219
33. Brady KT, Myrick H, McElroy S. The relationship between substance use disorders, impulse control disorders, and pathological aggression. Am J Addict 1998;7:221–230
34. Moeller FG, Barratt ES, Dougherty DM, et al. Psychiatric aspects of impulsivity. Am J Psychiatry 2001;158:1783–1793
35. Roy A. Characteristics of opiate dependent patients who attempt suicide. J Clin Psychiatry 2002;63:403–407
36. Petry NM. Substance abuse, pathological gambling, and impulsiveness. Drug Alcohol Drug Depend 2001;63:29–38
37. McCormick RA. Disinhibition and negative affectivity in substance abusers with and without a gambling problem. Addict Behav 1993;18:331–336
38. Brodsky BS, Malone KM, Ellis SP, et al. Characteristics of borderline personality disorder associated with suicidal behavior. Am J Psychiatry 1997;154:1715–1719
39. Brodsky BS, Oquendo M, Ellis S, et al. The relationship of childhood abuse to impulsivity and suicidal behavior in adults with major depression. Am J Psychiatry 2001;158:1871–1877
40. Herpertz S, Favazza A. Impulsivity in self-mutilative behavior: psychometric and biological findings. J Psychiatr Res 1997;31:451–465
41. Mann JJ, Waternaux C, Haas GL, et al. Toward a clinical model of suicidal behavior in psychiatric patients. Am J Psychiatry 1999;156:181–189
42. Baca-García E, Diaz-Sastre C, Basurte E, et al. A prospective study of the paradoxical relationship between impulsivity and lethality of suicide attempts. J Clin Psychiatry 2001;62:560–564

