Jiménez-Murcia S, Aymamí N, Gómez-Peña M, Santamaría JJ, Álvarez-Moya E, Fernández-Aranda F, Granero R, Penelo E, Bueno B, Moragas L, Gunnard K, Menchón JM. (2012). Does exposure and response prevention improve the results of group cognitive-behavioural therapy for slot machine pathological gamblers? ***British Journal of Clinical Psychology, 51,*** **54-71. doi: 10.111/j.2044-8260.2011.02012.x**

Abstract

Introduction. Cognitive-behavioural therapy (CBT) seems to offer effective treat- ment for pathological gambling (PG). However, it has not yet been established which techniques yield the best results, or whether exposure and response prevention (ERP) techniques are of additional use. Objectives. To evaluate clinical and socio-demographic characteristics of a PG sample at baseline, comparing cognitive-behavioural group intervention, with and without exposure, with response prevention (CBT + ERP vs. CBT), to compare the results of therapy and to assess pre-post changes in psychopathology between both groups. Design. We applied a quasi-experimental design comprising intervention on the independent variable, but without random assignment. Methods. The sample comprised 502 males with PG, consecutively admitted to a specialist unit, who received standardized outpatient CBT group therapy in 16 weekly sessions. Scores on the Symptom Checklist-Revised (SCL-90-R), the Temperament and Character Inventory-Revised (TCI-R), the South Oaks Gambling Screen (SOGS), and other clinical and psychopathological scales were recorded. Results. Pre-post changes did not differ between groups, except for SCL paranoid ideation, being greater in the CBT therapy group. The risk of relapse during treatment was similar in the CBT + ERP and CBT patients. However, compliance with treatment was poorer in the CBT + ERP group, who presented higher drop-out rates during treatment. Drop-out during therapy was associated with shorter disorder duration and higher scores on the TCI-R novelty seeking scale. Conclusions. Although the two CBT programs elicited similar therapy responses, patients receiving CBT alone showed higher adherence to therapy and lower drop-out rates.

Introduction

Pathological gambling (PG) is a major health problem, with severe consequences for the individuals involved and their relatives. The loss of control over gambling is associated with several cognitive, behavioural, and physiological symptoms (Blaszczynski & Nower, 2002). PG was included in the first edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) (APA, 1980) as an impulse control disorder. Its lifetime prevalence in the adult general population ranges between 0.5% and 12.9% in North America (Shaffer, Vander Bilt, & Hall, 1999) and in Europe (Becona, 1997).

Research into the efficacy of treatments for PG is recent and relatively limited (Petry, Weinstock, Ledgerwood, & Morasco, 2008). Review studies and meta-analyses of the effectiveness of psychological treatments for reducing gambling behaviour (Oakley- Browne, Adams, & Mobberley, 2003; Pallesen, Mitsem, Kvale, Johnsen, & Molde, 2005; Gooding & Tarrier, 2009) have stressed the value of cognitive-behavioural therapy (CBT) in follow-up studies of up to 3 months, regardless of the type of problem gambling involved.

Several behavioural treatment programmes including approaches such as aversion therapy, imaginal desensitization, *in vivo* exposure with response prevention (ERP), imaginal relaxation, and stimulus control (Hodgins & Peden, 2008) have been used to treat PG. Cognitive treatment can also significantly decrease PG (Ladouceur *et al.*, 2001; Ladouceur *et al.*, 2003; Sylvain, Ladouceur, & Boisvert, 1997). Behavioural, cognitive, and combined therapies have been demonstrated to be effective to treat PG, and CBT has the optimal short-term outcome (Gooding & Tarrier, 2009).

Of the techniques habitually applied, only three are specific for this disorder [cognitive restructuring, exposure with response prevention (ERP), and imaginal de- sensitization]; the rest are common therapeutic strategies for addictions in general. Techniques aimed at modifying dysfunctional beliefs such as ERP and imaginal desen- sitization have been proposed for treating the urge to gamble (Tavares, Zilberman, & el-Guebaly, 2003).

Several reviews (Blaszczynski & Silove, 1995; Ladouceur & Shaffer, 2005; Toneatto & Ladouceur, 2003) and meta-analytic studies (Oakley-Browne *et al.*, 2003; Pallesen *et al.*, 2005; Gooding & Tarrier, 2009) have shown that psychological intervention, and specifically CBT, is the most effective approach to the treatment of PG. However, few studies to date have focused on predictive factors of psychotherapy outcome (Lopez Viets & Miller, 1997; Echeburúa, Fernández-Montalvo, & Báez, 2001; Oakley-Browne, Adams, & Mobberley, 2000; Oakley-Browne *et al.*, 2003; Pallesen *et al.*, 2005).

The few studies of this issue suggest that poor treatment outcome in PG is associated with high levels of psychopathological distress (Specker, Carlson, Edmonson, Johnson, & Marcotte, 1996; Echeburúa *et al.*, 2001; Jiménez-Murcia *et al.*, 2007), longer duration and higher severity of the disorder (Milton, Crino, Hunt, & Prosser, 2002), and low motivation for change (Farkas *et al.*, 1996). Recent studies suggest that involving the individual's partner or other family members in the treatment process has a positive effect (Bertrand, Dufour, Wright, & Lasnier, 2008; Ingle, Marotta, McMillan, & Wisdom, 2008).

As little information is currently available on predictors of response to psychological outpatient interventions, it is difficult to establish which components or specific techniques yield the best results (Sylvain *et al.*, 1997; Toneatto & Ladouceur, 2003). One of the few controlled studies of this issue (Echeburúa, Báez, & Fernández-Montalvo, 1996; Echeburúa, Fernández-Montalvo, & Báez, 2000), which compared individual ERP versus group cognitive therapy versus combined therapy, showed that ERP results were superior to the group or combined treatments after 12 months' follow-up. However, because of the small sample size (16 per condition) or other methodological flaws, the results should be replicated (Petry, 2004; Toneatto & Ladouceur, 2003). The effect of combining these techniques is unknown at present (Sylvain *et al.*, 1997; Toneatto & Ladouceur, 2003).

In this study, we present the results obtained with the combination of CBT plus ERP, and assess whether it improves on the package of techniques applied in standard CBT-based programs for PG. The study has two main aims: (1) to evaluate the clinical and socio-demographic characteristics of a PG sample, comparing cognitive-behavioural group intervention with and without ERP; (2) to compare results of therapy and to assess pre-post changes in psychopathology between both groups.

Despite the fact that the ERP technique has been shown effective in treatment of various disorders, such as in phobias or in obsessive-compulsive disorders, even when being the first choice treatment, (Foa *et al.*, 2005; Foa, 2010; Koran, Hann, Hollander, Nestadt, & Simpson, 2007; Marks, 1997), the empirical evidence of its effectiveness in general addictions are scarce (Havermans & Jansen, 2003). There are few studies that demonstrate the effectiveness of treatment protocols that include ERP techniques in PG (Echeburúa *et al.*, 1996; Echeburúa *et al.*, 2000). Thus, based on the scarce information available in the literature, we hypothesized that the combination of CBT plus ERP would not be greater than CBT alone. In fact, we hypothesized the CBT + ERP condition to achieve lower treatment response (more dropouts and relapses and poor compliance). The clinical impression of the cognitive-behavorial therapists that have used ERP at our unit (SJM, MNA, and MGP) over a number of years is that patients have difficulty in understanding the theoretical justification of the technique and that their compliance with treatment is poor. These clinical observations formed the basis of our hypothesis.

Method

Participants

The sample included 502 slot-machine PG patients who were consecutive referrals for assessment and outpatient treatment at a Pathological Gambling Unit in the psychiatric department of a general hospital. All participants were diagnosed with the Diagnostic Questionnaire for PG according to DSM-IV criteria by Stinchfield (Stinchfield, 2003). Diagnoses were made by skilled psychologists and psychiatrists with more than 15 years of clinical experience in PG.

Individuals were excluded from the analyses if they had missing values for any diagnostic items. From an initial sample of 673 pathological gamblers, the following individuals were excluded: 28 females; 108 patients who did not receive group treatment, and 35 for whom relevant data were missing. Given the low presence of women, and in view of the clinical differences between the sexes in the effect of treatment, we decided to exclude them from the analysis in order to avoid possible bias in the results.

To facilitate better understanding of the participants, we present the data following the modified CONSORT flow diagram for non-pharmacological trials (Boutron *et al.*, 2008; Figure 1).

Participants were recruited between May 2002 and April 2008. There is an overlap in the current sample and the time frame between this study and a previous published study (Jiménez-Murcia *et al.*, 2007). The small overlapping sample is basically due to the coincident time of recruitment. However, whereas the recruitment in the previous published study was of 2 years (2003–2005), the current study was more global and had a broader time frame of recruitment (7 years, 2002–2008). Of the 502 participants in this study, those assigned to CBT, a total of 313 patients participated in this type of groups (a total of 31 groups). Out of those 31 groups, nine groups (n = 108 patients) were coincident with the previous published study. Patients treated with the CBT + ERP condition were completely new cases (189 patients who participated in a total of 19 outpatient groups). The Ethics Committee of our hospital approved the study, and an informed consent was obtained from all participants.

Instruments

Personality and psychopathological status

Temperament and Character Inventory-Revised (TCI-R) (Cloninger, 1999). The TCI- R (Cloninger, 1999) is a reliable, valid 240-item questionnaire that, like the original TCI version (Cloninger, Svrakic, & Przybeck, 1993), measures seven personality di- mensions: four temperament (harm avoidance, novelty seeking, reward dependence, and persistence) and three character dimensions (self-directedness, co-operativeness, and self-transcendence). All items are measured with a five-point Likert-type scale. The performance on the Spanish version of the original questionnaire (Gutiérrez *et al.*, 2001) and the revised version (Gutiérrez-Zotes *et al.*, 2004) have been validated. The scales in the latter version showed adequate internal consistency (Cronbach's alpha value of 0.87).

Symptom Checklist-Revised (SCL-90-R) (Derogatis, 1990). We used the SCL-90-R to evaluate a broad range of psychological problems and psychopathological symptoms. This test contains 90 items and helps to measure nine primary symptom dimensions: som- atization, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, and psychoticism. It also includes three global indices: (1) a global severity index (GSI), designed to measure overall psychological distress; (2) a positive symptom distress index (PSDI), to measure the intensity of symptoms; and (3) a positive symptom total (PST). The GSI can be used as a summary of the test. This scale has been validated in a Spanish population (Derogatis, 2002), with a mean internal consistency of 0.75 (Cronbach's alpha).

Gambling behaviour and diagnostic criteria

South Oaks Gambling Screen (SOGS) (Lesieur & Blume, 1987); *Spanish validation by* (Echeburúa, Báez, Fernández, & Páez, 1994). This is a 20-item diagnostic questionnaire that discriminates between probable pathological, problematic, and non-problematic gamblers. The Spanish validation of this questionnaire shows high reliability and validity. Its test-retest reliability is 0.98 ($p < .001$), and its internal consistency is 0.94 (Cronbach's alpha). Convergent validity with regard to DSM-III-R criteria for PG (APA, 1987) was estimated at 0.92 ($p < .001$).

Stinchfield's Diagnostic questionnaire for PG according to DSM-IV criteria (Stinchfield, 2003); Spanish validation by (Jiménez-Murcia et al. 2009) This is a 19-item questionnaire reflecting the DSM-IV diagnostic criteria for PG. Its reliability was estimated by using a measure of internal consistency (Cronbach's alpha), which yielded values of ? = 0.81 for the general population and ? = 0.77 for a gambling treatment group. Convergent validity in comparison to the SOGS questionnaire was estimated as $r = .77$ ($p < .01$) for the general population and $r = .75$ ($p < .01$) for a gambling treatment group (Stinchfield, 2003).

Other socio-demographic and clinical variables. Additional demographic, clinical, and social/family variables related to gambling were measured using a semi-structured face- to-face clinical interview described elsewhere (Jiménez-Murcia *et al.*, 2007). Throughout the treatment period, attendance, control of spending, and gambling behaviour, com- pliance with treatment (good, fair, or poor, rated subjectively by the therapist) were recorded on an observation sheet, as well as the occurrence of relapse, desire or urge to gamble, avoidance of risk situations, and instructions for the following session (or homework). This observation sheet was completed during the treatment session by both the therapist and the co-therapist. At the end of the session, the records were compared in order to judge the level of inter-rater agreement.

Procedure

We applied a quasi-experimental design with the intervention as the independent variable but without random assignment. Experienced psychologists and psychiatrists conducted the first two face-to-face clinical interviews. In addition to a comprehensive clinical and psychological evaluation, including the use of the instruments mentioned above, demographic data were also obtained at the beginning of therapy. Patients were also assessed during the last appointment of therapy.

Treatment

Patients were assigned to an outpatient CBT group either with or without gradual *in vivo* ERP (CBT or CBT + ERP). Both groups contained 10 to 14 patients and received 16 weekly outpatient sessions lasting 90 min each. Each group was led by an experienced psychologist and a co-therapist who was also a clinical psychologist. The goal of the treatment was to train patients to implement CBT strategies in order to achieve full and definitive abstinence from all types of gambling. The general topics addressed in both groups included psycho-education regarding the disorder (its course, vulnerability factors, diagnostic criteria, biopsychosocial models of PG, phases, etc.), stimulus control (money control, avoidance of risk situations, self-exclusion programme, changing risky routes, etc.), response prevention (alternative and compensatory behaviours), cognitive restructuring focused on illusions of control over gambling and magical thinking, reinforcement and self-reinforcement, skills training, and relapse-prevention techniques. This treatment program and the accompanying materials have already been published in Spain (Jiménez-Murcia *et al.*, 2005). The short- and medium-term effectiveness of this group CBT approach and the predictors of therapy outcome has been demonstrated in previous research (Jiménez-Murcia *et al.*, 2007).

Additionally, individuals in the CBT + ERP group received specific instructions for ERP implementation that started after the second group session. ERP consists in confronting patients *in vivo* with stimuli or situations that trigger the urge to gamble (exposure) and preventing them from carrying out the behaviour (response prevention). The concept underlying ERP, as described in other related disorders (Foa & Goldstein, 1978; Foa, Steketee, Grayson, Turner, & Latimer, 1984; Marks, Hodgson, & Rachman, 1975), is habituation: in our study, the patient was in contact with the stimulus that causes the sensation for a period of time ranging between 45 and 60 min, until the urge disappeared. The exposure exercises were gradual and progressive, with the amount of money the patients were carrying as the criterion of difficulty. ERP sessions were carried out in places where there were slot machines, with subjects spending the required time (45–60 min) in the presence of the activating stimulus (the machines). Patients were advised to wait if the urge to gamble had not disappeared in this period of time. All were slot machine gamblers. Initially they did not carry money, but as they grew accustomed to the situation and improved their self-control, they were allowed to carry money in increasing quantities. Moreover, in the four initial ERP sessions, one family member was involved to help the patient manage the urge to gamble in case of need. These exercises were designed as homework and the patients were required to complete self-report forms. Later, general aspects were discussed in a group setting. Patients were instructed to carry out two exposure sessions per

week. The patients receiving standard CBT received the same instructions and self-report forms, with the exception of the materials associated with the ERP, which were only indicated in the CBT + ERP group. The urge to gamble was recorded on a self-report form comprising a Likert scale of 1 (minimum) to 10 (maximum).

In this study, 50 outpatient groups (each with 10–14 patients) were conducted. Of the 502 participants, 313 received CBT (in 31 outpatient groups) and 189 received CBT + ERP (in 19 outpatient groups). The patients were not randomly assigned but consecutively admitted to the two treatment conditions and sequentially allocated in the study. Firstly, the CBT condition was applied (following our unit's standard treatment programme), followed by the CBT + ERP intervention.

To ensure treatment fidelity, therapists adhered to the treatment manual. The two therapists in charge of the treatment groups (NA and MGP) had more than 15 years of experience in running group CBT for PG. In fact, they were the co-authors of the treatment programme manual (Jiménez-Murcia *et al.*, 2006) and also co-signatories of the first studies published to validate the manual's results (Jiménez-Murcia *et al.*, 2005, 2006). Similarly, the therapist, co-therapist, and the rest of the team at the unit held weekly case discussions.

Statistical analysis

Statistical analyses were carried out with PASW 17 for Windows. Firstly, the risk (cumulative incidences) of categorical outcomes of the two treatments (presence of relapses, missing therapy sessions, poor compliance with treatment, and drop-out from the study) was obtained and compared with ? 2 tests.

Secondly, the predictive accuracy for treatment outcomes was assessed through logistic regressions. The inputs were the variables most frequently related in the literature to the final clinical state of patients: type of therapy, age, duration and intensity of gambling, and personality traits based on TCI-R scores. The goodness-of-fit of these models was evaluated with Hosmer-Lemeshow's test and the global discriminate accuracy with the area under the Receiver Operating Characteristic (ROC) curve (AUC) (Hosmer & Lemeshow, 2000).

Thirdly, survival functions were obtained (with Kaplan-Meier's estimation) and compared between treatments (with chi-square two Log-Rank or Mantel-Haenszel, Breslow, and Tarone-Ware tests). Survival methods examine the length of time (rate) to the occurrence of an event, labelled as the survival time. These methods are particularly useful for censored data, when the value of observations in the sample is only partially known (Hosmer & Lemeshow, 1999). In this study, we modelled the survival time to the presence of relapses and drop-outs during therapy. That is, for each patient, we measured the time since the beginning of treatment and the possible occurrence of relapses or drop-out.

Finally, analysis of covariance (ANCOVA) was used to compare pre-post changes on SOGS and SCL-90-R scores (dependent variables, obtained as the differences between baseline and the post-therapy) between both treatments (independent variable). In these models, the baseline values were considered as covariates, since the probability of change in clinical measures is often strongly associated with initial values.

Due to the presence of multiple comparisons for therapy outcomes, we controlled for type-I error inflation using Holm's adjustment (Holm, 1979), obtained with SPSS macros (Doménech, Bonillo, & Granero, 2000). This method is a modified (stepwise) Bonferroni's method that uses a sequential step-down procedure to adjust the *p*-values in order to control the FamilyWise Error Rate (FWER). In step-down methods, *p*-values are examined in order, from smallest to largest: once a *p*-value is found that is large according to a criterion based on alpha and the *p*-value's position in the list, that *p*-value and all larger *p*-values are accepted. Holm's correction procedure has proved to be a good alternative to Bonferroni's correction procedure, which is considered too conservative and insufficiently powerful to detect real significances.

Results

Baseline clinical, personality, and socio-demographic characteristics

The sample included 502 slot-machine PG patients. Around half of the patients had finished elementary (53.1%) or high school (41.6%) education, most were married or lived with a partner (60.2%), and most were employed (80.5%). Mean age was 39.8 years (*SD* = 12.5). The mean duration of the disorder was 5.0 years (*SD* = 4.8). Although slot-machine gambling was the main problem for most participants (93.7%), 10.5% also reported secondary problems with bingo and 11.0% with lotteries.

No differences were found regarding socio-demographic variables in the two groups (CBT + ERP vs. CBT). In the CBT + ERP group, 56.5% completed elementary school, 38.7% completed high school, and 4.8% went to university, and in the CBT group the corresponding percentages were 53.0%, 43.6%, and 3.4% (p = .673). Regarding marital status, 33.0% of the CBT + ERP group were single, 56.4% were married or with a partner, and 10.6% were separated or divorced; the percentages in the CBT group were also similar (27.8%, 62.5%, and 9.7%, respectively; p = .616). As for employment status, 78.2% of the CBT + ERP group were in work, compared with 81.9% of the CBT group (p = .570). Age (M = 40.2 years, SD = 12.8 for CBT + ERP group and M = 39.6 years, SD = 12.4 for CBT group; p = .673), age of onset (M = 35.5 years, SD = 12.4 for CBT + ERP group and M = 34.6 years, SD = 12.2 for CBT group; p = .673), and duration of the problem (M = 4.9 years, SD = 4.4 for CBT + ERP group and M = 5.0 years, SD = 4.7 for CBT group; p = .673) did not differ between groups.

No significant differences in psychopathology (measured with the SCL90-R) or personality traits (measured with the TCI-R) were observed between CBT + ERP and CBT individuals at baseline. However, psychopathological disturbances and non-adaptive personality profiles were observed in both groups. In particular, high scores on all of the SCL-90-R dimensions were obtained, indicating the presence of severe distress levels. Regarding personality traits, high scores on novelty seeking and low on self-directedness were observed.

Moreover, baseline SOGS-total mean scores did not differ statistically between CBT + ERP and CBT (p = .418).

Predictive accuracy of ERP and baseline psychopathology for therapy outcomes

The two groups (CBT + ERP and CBT) did not significantly differ regarding the risk of relapses (defined as any episode of gambling associated with a previously problematic game during treatment (16.9 vs. 25.5%, respectively; p = .060). However, the likelihood of not attending more than 25% of sessions during treatment was higher in CBT + ERP than in CBT [60.8% vs. 38.8%, respectively, Risk Ratio (RR) = 1.57 (95% CI: 1.31 to 1.88), $p < .001$] as was the probability of poor compliance [38.6% vs. 21.9%, RR = 1.76 (95% CI: 1.30 to 2.38), $p < .001$] and the risk of drop-out (defined as missing groups sessions on three or more occasions without notifying the therapist) during the 16-session program [53.4% vs. 29.7%, RR = 1.80 (95% CI: 1.45 to 2.23), $p < .001$]. CBT + EPR patients attended less sessions (M = 7.6; SD = 5.9) than CBT (M = 10.6; SD = 5.7). Only 3.7% of CBT + ERP patients attended the 16 sessions, compared with 19.4% of the CBT group.

Table 1 shows the logistic regression model that evaluates the predictive accuracy of ERP treatment and other baseline psychopathological measures regarding the main therapy outcomes of the study. Pathological SOGS-total scores after therapy increased with higher values on the TCI self-transcendence scale (OR = 1.08, p = .028). Missing more than 25% of sessions was associated with shorter duration of problem gambling (OR = 0.96, p = .038) and higher scores on TCI-novelty seeking scale (OR = 1.03, p = .020). Poor compliance was associated with ERP treatment (OR = 2.31, p = .025), and drop-out from the study during the 16-session therapy schedule was associated with ERP treatment (OR = 2.76, p = .003) and higher means on the TCI-novelty seeking score (OR = 1.03, p = .029). Finally, the possibility of relapses during therapy was not associated with type of treatment or with other individual measures. All logistic models obtained good adjustment (p-values > .05 on the Hosmer-Lemeshow's goodness-of-fit tests) and discriminative accuracy was good or very good (values ranging between 0.65 and 0.85). The results from the structured clinical interviews were not included as an outcome measure because they were only conducted at the baseline assessment.

Survival analysis for relapses and drop-out during treatment

Although the survival functions (Kaplan-Meier estimations) showed a lower tendency toward relapse during therapy in patients receiving ERP treatment, no statistical differences were achieved on the Log-Rank (? 2 = 0.85, p = .358), Breslow (? 2 = 1.01, p = .316), or Tarone-Ware (? 2 = 0.93, p = .335) tests. In the sample as a whole, 10% of patients relapsed during the first month of therapy (weeks 1 to 4), 15% by the end of the second month, and approximately 19% by the end of the third month. Patients who achieved 12 weeks without relapse tended to complete the treatment successfully (less than 2% of the sample relapsed during the fourth month of therapy). The accumulated proportion at the end of the 16 sessions was 0.794, which means that 20.6% of the patients relapsed at the end of therapy (Figure 2, left).

The rate of drop-out assessed using Log-Rank (? 2 = 26.92; p < .001), Breslow (? 2 = 24.10; p < .001), and Tarone-Ware (? 2 = 25.65; p < .001) tests varied according to treatment. During the first month of therapy, 34% of patients in CBT + ERP group dropped out compared with only 18% of patients in CBT group. By the end of the second month, 42% of patients CBT + ERP and 23% of patients in CBT had dropped out, and by the end of third month, 51% of the patients in CBT + ERP and 27% of the patients in CBT. However, patients who achieved 12 weeks without dropping out tended to complete the treatment successfully (only 2.6% CBT + ERP and 2.2% cases in CBT dropped out during the fourth month). The accumulated proportions at the end of the therapy were 0.466 for the CBT + EPR group and 0.703 for the CBT group, therefore, as we mentioned earlier, the percentage of drop-out was 53.4% and 29.7%, respectively (Figure 2, right).

Pre-post changes in psychopathology based on ERP therapy

Table 2 includes the pre and post measures for both groups of treatment (left) and the results of the ANCOVA procedures that compared the pre-post changes adjusted by baseline values (right). Pre-post differences did not statistically differ between CBT + ERP and CBT treatments, except for SCL paranoid ideation scale (p = .046). For this measure, the decrease after therapy was 0.14 points lower (95% CI: 0.0 to 0.3 points) for CBT + EPR therapy than for CBT (adjusted mean changes: 0.18 vs. 0.32 points, respectively).

Discussion

This study investigated the effectiveness of two CBT group conditions (with and without ERP) in a sample of pathological gamblers at the end of the treatment. We also explored the ability of clinical variables to predict treatment outcome and assessed and compared internal therapy outcome measures by means of survival analyses.

As reported in earlier studies, most pathological gamblers in our initial sample were male, employed (Kessler *et al.*, 2008; Shaffer, Hall, & Van der Bilt, 1999), and their main gambling problem was slot machine use (Jiménez-Murcia *et al.*, 2007; Wood & Griffiths, 1998). Mean problem duration was 5 years, which is also consistent with other reports (Breen & Zimmerman, 2002; Tavares, Zilberman, Beites, & Gentil, 2001). Our results confirm that PG is related to significant psychiatric comorbidity (Crockford & el-Guebaly, 1998; Dell'Osso, Allen, & Hollander, 2005). Several studies have observed that gambling is used to regulate negative emotional estates associated to life-events, dissatisfactions, and frustrations (Burge, Pietrzak, Molina, & Petry, 2004; Grant & Kim, 2002; Hand, 1998; Jiménez-Murcia *et al.*, 2007; Potenza *et al.*, 2001; Scannell, Quirk, Smith, Maddern, & Dickerson, 2000).

Our study showed that patients in the CBT group had lower drop-out rates, both during and at the end of the treatment. No differences were observed with regard to relapses. Nevertheless, it cannot be definitely concluded that this type of treatment is superior to CBT + ERP, given that randomization is lacking in the study. This result partially corroborates those of other studies (Echeburúa *et al.*, 1996), which demonstrated the effectiveness of stimulus control (SC) and ERP. However, due to the specific design used, those studies were unable to distinguish between the specific techniques conducted or to establish whether the positive results were due to SC or ERP. Our results suggests that the addition of ERP to CBT provides limited benefits, since our group of patients treated with this technique presented higher drop-out rates, poorer attendance at sessions, and, in general, poorer compliance with therapy between sessions both during treatment and at the end of the therapy. Although the efficacy of ERP in the treatment of various disorders

has been demonstrated (e.g. anxiety disorders, Bisson & Andrew, 2007; Hembree *et al.*, 2003; Jaurrieta *et al.*, 2008), the dropout rates in these treatments may also be high. Following Melville, Casey, & Kavanagh (2007), the dropout rate in PG after CBT + ERP may be due to several specific factors, such as socio-demographic variables (age and educational level), individual variables (lower motivation before complex tasks, specific personality traits), and even variables associated with the treatment itself (for instance, limited comprehension of this technique and its use, or low satisfaction with ERP due to its complexity). The use of CBT to treat addictions in general (McKay, 2007; McKay *et al.*, 2004; McLellan, Carise, & Kleber, 2003) and PG in particular (Jiménez-Murcia *et al.*, 2007) is time-consuming and the effort required of the patient is high; hence in the opinion of the authors, it might be preferable to use simple CBT approaches rather than complex ones, especially to reduce drop-out rates (although patients treated with CBT also had homework, it was significantly less). However, this is only so if we assume that drop-out from treatment is negative: it is possible that subjects drop out because they are doing well, because they have achieved what they wanted, or because they did not like the treatment. The fact that the drop-out rate was significantly higher in the CBT + ERP condition suggests that the explanation may be related to the specific characteristics of this kind of intervention.

One of the main problems regarding the efficacy of treatments for PG is the lack of standardized methods to analyze the issue. As authors use different approaches to measure treatment efficacy, data comparison is usually difficult and unreliable. Although most studies on treatment efficacy tend to focus only on changes in gambling behaviour (frequency, bet size, abstinence, and dropout rates) (Toneatto, 2005), some authors also compare pre- and post-treatment psychometric measures (Ladouceur *et al.*, 2003). Our findings seem to be in agreement with the few reports that assess the latter issue (Oakley-Browne, Adams, & Mobberley, 2000; Pallesen, *et al.*, 2005; Toneatto & Ladouceur, 2003). We observed a significant decrease in the level of psychopathology and severity of gambling behaviour after an outpatient cognitive-behavioural group treatment, regardless of whether the ERP technique was added or not. This result corroborates previous studies that show that PG can be successfully treated and that CBT is one of the treatments of choice, even after follow-up (Myrseth, Litlere, Stoylen, & Pallesen, 2009; Pallesen, *et al.*, 2005; Raylu & Oei, 2002; Toneatto, 2005; Toneatto & Ladouceur, 2003). However, the subjects treated additionally with ERP showed a less significant change on the paranoid thought sub-scale. This dimension, interpreted as fear of losing autonomy, amongst other aspects (Derogatis, 2002), could reflect this group's subjects difficulty to accept a treatment programme implying realization of various exercises between sessions and filling out different self-reports. Previous work on applied CBT in different disorders has shown that more flexibility and more realistic expectations regarding homework can improve the adherence to a treatment and, therefore, the response to it (Berg, Raminani, Greer, Harwood, & Safrens, 2008). Differences in the sub-scale of paranoid ideation were observed between the two groups. However, the most significant finding of the study was that the two groups showed similar results, at least in terms of relapses. Furthermore, the group treated with CBT alone responded better to treatment, in relation to the number of drop-outs.

Limitations of this study include (1) the lack of randomization; (2) the lack of more specific assessment measures (e.g., structured interview for Axis II comorbid disorders); (3) the lack of a control group (there is no waiting list at our unit and for ethical reasons patients cannot be assigned to a control group,) or other treatment settings (e.g., individual therapy), for comparison purposes; (4) the small number of therapists (only two for all of groups); (5) due to the sequential allocation of patients, it is possible that changes in treatment delivery or other contextual factors may have taken place between the treatment of the first sample of patients using CBT and the second sample using CBT + ERP that was introduced at a later date; (6) the lack of follow-up data; and (7) possible aptitude-treatment interactions (i.e., some patients do well in CBT +ERP and some do not), especially in complex treatments with multiple tasks between sessions.

Conclusion

Our findings suggest that, in general, outpatient group CBT was effective for treating PG individuals, even at 6-month follow-up. We also found that the first 5 weeks of treatment were critical in order to achieve adherence to therapy. Furthermore, high levels of psychopathology and novelty seeking were predictors of poor treatment outcome, whereas persistence traits acted as a good prognosis factor. Finally, the additional use of ERP within a CBT programme was not beneficial when treating PG, due to its increasing effect on the drop-out rates.

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Table 1

	Logistic regressions: OR parameters (ENTER procedure)												
Criteria predictors	ERP	Age	Duration	SOGS	TCI: NS	TCI: HA	TCI: RD	TCI: PE	TCI: SD	TCI: CO	TCI: ST	H-L	AUC
SOGS post > 2	0.55	1.05	0.94	1.08	0.97	0.96	0.95	0.98	0.99	1.03	1.08*	.546	.851
Relapses during treatment	0.52	0.99	1.01	1.04	0.98	0.97	0.98	0.99	0.99	1.03	1.01	.195	.652
Lack of attendance	1.72	0.97	0.96*	0.96	1.03*	0.99	0.98	1.01	0.99	1.01	0.99	.745	.721
Poor compliance	2.31*	1.00	0.99	1.00	1.02	1.00	1.01	1.01	1.01	0.98	0.98	.288	.661
Drop-outs	2.76*	0.97	0.97	0.97	1.03*	1.00	1.00	1.00	1.00	1.00	1.00	.177	.714

Table 2

	Observed means (*SD*)				ANCOVA comparing pre-post changes			
	Pre-values (baseline)		Post-values		Adjusted mean changes (*SE*)			Mean differences (CI 95%)
	CBT	CBT + ERP	CBT	CBT + ERP	CBT	CBT + ERP	*p*	(CBT – CBT + ERP)
SOGS: total score	10.70 (2.86)	10.12 (2.95)	1.64 (1.63)	1.27 (0.71)	8.92 (0.11)	9.24 (0.19)	.131	−0.33 (−0.76; 0.10)
SCL: Somatization	0.60 (0.59)	0.73 (0.64)	0.35 (0.46)	0.52 (0.61)	0.27 (0.03)	0.15 (0.06)	.086	0.12 (−0.02; 0.25)
SCL: obsessive – compulsive	0.81 (0.66)	0.80 (0.69)	0.40 (0.50)	0.48 (0.58)	0.41 (0.03)	0.32 (0.06)	.170	0.09 (−0.04; 0.22)
SCL: interpersonal sensitivity	0.74 (0.58)	0.73 (0.70)	0.32 (0.43)	0.42 (0.54)	0.41 (0.03)	0.31 (0.06)	.107	0.10 (−0.02; 0.23)
SCL: depressive	1.15 (0.76)	1.09 (0.84)	0.47 (0.50)	0.54 (0.73)	0.67 (0.04)	0.58 (0.07)	.246	0.09 (−0.06; 0.24)
SCL: anxiety	0.71 (0.64)	0.67 (0.69)	0.28 (0.41)	0.38 (0.56)	0.42 (0.03)	0.31 (0.05)	.079	0.11 (−0.01; 0.22)
SCL: hostility	0.67 (0.65)	0.67 (0.66)	0.34 (0.49)	0.36 (0.52)	0.34 (0.03)	0.31 (0.06)	.720	0.02 (−0.11; 0.16)
SCL: phobic anxiety	0.27 (0.38)	0.25 (0.45)	0.15 (0.33)	0.11 (0.22)	0.12 (0.02)	0.15 (0.03)	.418	−0.03 (−0.11; 0.05)
SCL: paranoid ideation	0.66 (0.61)	0.67 (0.62)	0.34 (0.47)	0.49 (0.61)	0.32 (0.06)	0.18 (0.06)	.046	0.14 (0.00; 0.28)
SCL: psychotic	0.54 (0.51)	0.64 (0.68)	0.22 (0.36)	0.31 (0.53)	0.33 (0.03)	0.28 (0.05)	.337	0.05 (−0.05; 0.16)
SCL-90-R: GSI score	0.76 (0.57)	0.76 (0.59)	0.34 (0.38)	0.43 (0.49)	0.42 (0.03)	0.33 (0.05)	.121	0.09 (−0.02; 0.20)
SCL-90-R: PST score	38.3 (20.7)	37.0 (19.6)	21.3 (18.4)	24.5 (21.2)	16.9 (1.25)	13.0 (2.12)	.113	3.91 (−0.94; 8.76)
SCL-90-R: PSDI score	1.64 (0.46)	1.72 (0.50)	1.29 (0.46)	1.45 (0.56)	0.37 (0.04)	0.24 (0.06)	.076	0.13 (−0.01; 0.27)

Figure 1

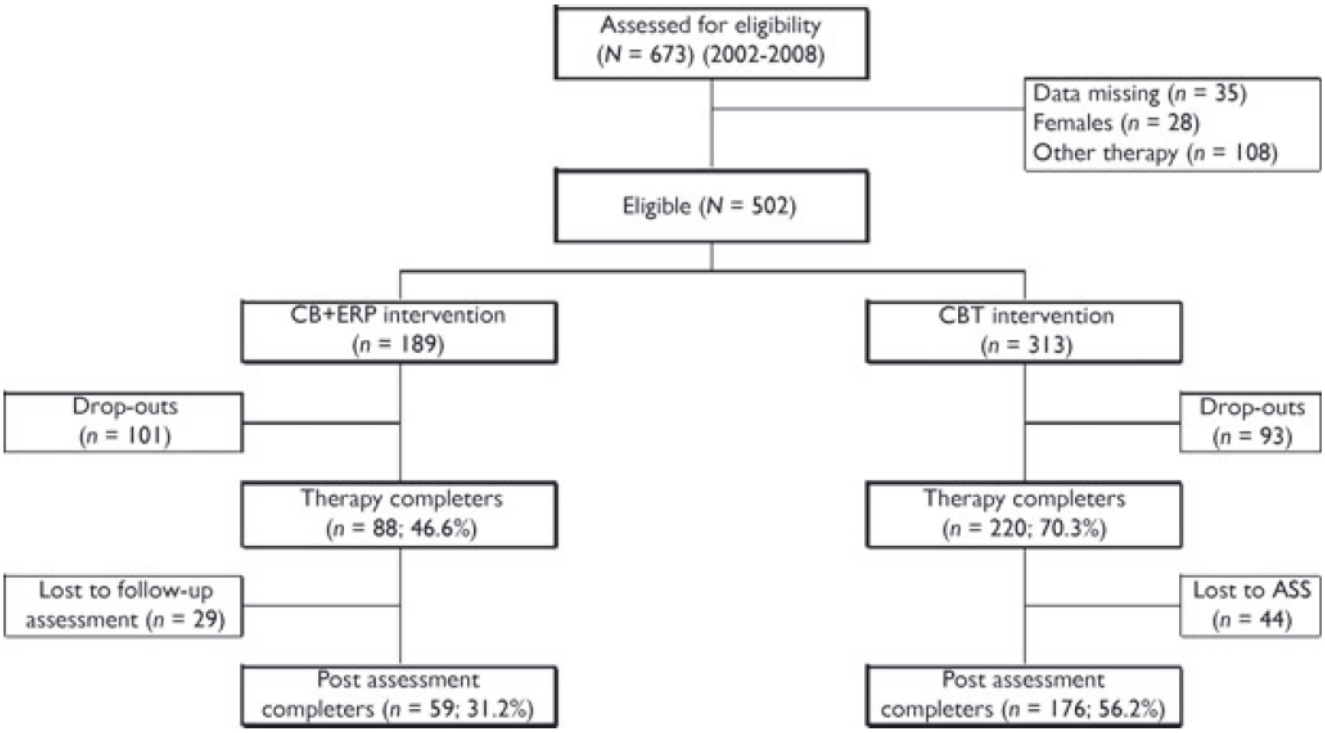

Figure 2