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Predictors of dropout from inpatient treatment for anorexia nervosa: Data from a large French sample

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ABSTRACT

Dropout from anorexia nervosa inpatient treatment programs is frequent and is linked to a poorer outcome. This study aimed to identify predictive factors for dropout among anorexia nervosa inpatients. Between 1988 and 2004, 601 consecutive female inpatients with anorexia, restrictive (AN-R) or binge/purging (AN-B/P) subtype (Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV)), were assessed at admission (clinical, socio-demographic, and psychological data). A stepwise logistic model was developed. Dropout rates were respectively 50.0% and 56.2% for AN-R and AN-B/P. Seven predictive factors were identified in multivariate analysis: having one or more children, low desired body mass index (BMI), a low minimum BMI, high scores on the SCL-90 *paranoid ideation* and the Morgan and Russell *eating behavior subscales,* and low educational status. Early dropouts had a particular profile: lower desired BMI, higher score on SCL90 paranoid subscale, and more impulsive behaviors (alcohol use, suicide attempts). Dropout appeared as a multifactorial event. In clinical practice, certain factors could serve as warning messages reflecting the severity of the illness (high EDI score and low minimum BMI); while others could be targeted before hospitalization (having at least one child and low desired BMI).

1. Introduction

Anorexia nervosa (AN) patients are difficult to treat (Halmi et al., 2005; Vandereycken and Van Humbeeck, 2008) and frequently drop out of treatment (Halmi et al., 2005). Inpatient treatment for AN is indeed known for its high rates of dropout (20% to 51%) (Vandereycken and Pierloot, 1983; Kahn and Pike, 2001; Surgenor et al., 2004; Woodside et al., 2004; Zeeck et al., 2005; Masson et al., 2007). Patients who drop out from inpatient care have an increased risk of relapse within the first year, exhibit more numerous eating disorder symptoms at follow-up (Baran et al., 1995), and have a more chronic and severe course of illness (Strober et al., 1997). We recently published a review of the literature on dropout among AN inpatients (Wallier et al., 2008). The seven studies selected were difficult to compare because of four methodological issues. There were differences and variability in sample composition, treatment protocols, definition of dropout, and factors explored as predictors of dropout (for details see Wallier et al. (2008)). Because of the comparatively small samples (from 77 to 268 inpatients) and the diversity of the factors tested, there is still considerable uncertainty regarding factors predicting dropout from AN inpatient treatment programs. Despite these limitations, weight on admission, AN subtype, and the absence of depression appear to be related to dropout from inpatient care. In addition, further research is needed including a larger sample, as it is likely that a number of factors explain dropout from inpatient care.

In response to these elements, the aim of the present study was to more fully explore predictors of premature discharge from inpatient treatment for anorexia nervosa, in order to identify clinical signs that could alert the clinician to the risk for dropout, and/or possible targets for treatment.

2. Methods

2.1. Patient population

The original sample comprised all 601 consecutive female patients who met Diagnostic and Statistical Manual of Mental Disorders, fourth edition (DSM-IV) criteria for AN hospitalized for the first time in the eating disorder (ED) Unit of the Clinique des

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Maladies Mentales et de l'Encéphale at Sainte-Anne Hospital, Paris, France, between February 1988 and July 2004. The start of data collection corresponds to the opening date of the ED unit. The exclusion criteria were patient refusal, and inability to understand and read French and to complete forms and questionnaires. This work was accepted by the French national committee for private freedoms CNIL (*Comité National Informatique et Libertés*) and by a French ethical committee (CCTIR). The evaluation performed was part of the regular admission procedures. Patients were informed that the data were to be used in future studies, and verbal consent was obtained. Data used for the analyses were anonymous.

2.2. Inpatient treatment program

During the study period, patients were seen first in specialized outpatient consultation. They were informed about the inpatient treatment program if there was indication for admission (Gicquel, 2008). Hospitalization was on a voluntary basis. The first week of hospitalization was used for patient observation and instatement of the care program, defined in the therapeutic contract, drafted by the team and signed by both team and patient. The contract aimed to manage patients' ambivalence toward their illness (Vandereycken and Van Humbeeck, 2008) and to homogenize the team's strategies. The duration of hospitalization was often more than 3 months.

Briefly, the inpatient program (Gicquel, 2008) was multidisciplinary, based on a standardized contract including a final target weight (body mass index (BMI) strictly over 19). The team was made up, among others, of senior psychiatrists, a psychologist, nurses and auxiliary nurses, medical fellowships, a dietician, an art-therapist, a psychomotrician, a socio-esthetician, and a social worker. The overall protocol was the same for all patients. The inpatient treatment program comprised three phases. The first ("nutritional phase") aimed at weight gain, with weekly weight targets, and normalization of eating behaviors (stopping vomiting/purging, dietary diversification). Weight gain targets ranged from 500 g to 1 kg/week, suited to the patient. The total weight gain was spread over the first two phases, often 2/3 in the first phase and 1/3 in the second. The shift from 1st phase to 2nd varied, depending mainly on weight gain and individual factors. The 2nd phase ("psychological phase") focused on 1) an individualized psychological approach; 2) body oriented therapy, and 3) continuation of the 1st phase objectives. When the patient reached the target weight, the 3rd phase began. It consisted in "weight stabilization" with a progressive return to everyday life, through periods of "leave" of increasing duration. Tobacco use was authorized with a maximum 20 cigarettes a day progressively decreasing by one cigarette a week to five cigarettes a day. The patient could of course aim to quit smoking. Hospitalization was free of alcohol and purging substances (laxatives and diuretics) with checks on entry and during hospitalization.

Patients could leave the program voluntarily at any time, or could be discharged from the program by staff because of non-compliance with contract (e.g., lack of progress (e.g., non-completion of weight objectives) or repeated violation of unit rules (e.g., purging)). Staff-initiated termination was decided after 2 weeks of discussion with the patient about difficulties she was encountering in the treatment and encouragement to make appropriate changes.

2.3. Definition of dropout

Dropout was defined as any one-sided (team or patient) decision for a premature termination of the planned inpatient treatment. "Early dropout" was defined as leaving during the first week of the observational phase, before the personalized contract was signed. This "early dropout" was always decided by the patient. "Later dropout" was defined as occurring after the contract was signed, beyond the first week of hospitalization. Information on the origin of "later dropout" (i.e., initiated by the team or by the patient) was not available.

2.4. Assessment

As previously described (Fedorowicz et al., 2007), as part of regular admission procedures, all inpatients completed questionnaires (socio-demographic and clinical data) and were assessed by trained physicians or psychologists for the purpose of individualizing treatment.

Four self-report questionnaires and one clinician-rated scale were administered. The Hopkins Symptom Check List 90-R (SCL-90 R) (Derogatis, 1977) assesses a wide array of psychiatric symptoms over the previous 7 days through 90 items, each rated on a 5-point scale. The Eating Attitude Test 40 (EAT-40) (Garner and Garfinkel, 1979) is a 40-item, 6-point format, self-report scale measuring a broad range of ED symptoms. The Eating Disorder Inventory (EDI) (Garner et al., 1983) is a 64-item, 6-point format, self-report scale evaluating cognitive and behavioral dimensions typically found in ED subjects. The abridged version of the Beck Depression Inventory (BDI) (Beck et al., 1961, 1988) is a widely used 13-item self-report scale which measures behavioral, cognitive, and somatic symptoms of depression. Concerning the clinician-rated scale, the Morgan and Russell scale (Morgan and Hayward, 1988) uses 15 items which explore five dimensions: food intake, menstrual pattern, mental state, psychosexual state, and socioeconomic status. Each dimension is scored out of 12, which is the "normal score. The lower the score, the more ill the patient is.

2.5. Statistical analysis

Analyses were performed using SAS 8.2 (Statistical Analysis Software, 2004) and R 2.1.1. (R Development Core Team, 2004). Type one error for statistical tests of hypothesis was equal to 0.05. Given the clinical importance of the research, no adjustment for multiple testing was made ((Rothman, 1990; Bender and Lange, 2001) to avoid that potentially important findings could be undetected. The sample was described. Anorexia, restrictive (AN-R) and binge/purging (AN-B/P) were compared using chi-square tests or Student's *t*-test.

The variables tested in bivariate analysis were either reported to be significant in the literature, or were used to test a clinical hypothesis (see Table 3). Odds ratios (ORa) adjusted on the AN subtype were computed between dropout and possible predictors. Adjustment on AN subtype was performed because results concerning the influence of the subtype on dropout are numerous and contradictory (Wallier et al., 2008). For these predictors, the reference was the category where the lowest subject dropout was observed. Significant EDI subscales and those included in the multivariate model are shown in Table 3. The other subscales were not significant and are not shown.

A multivariate logistic model for the sample was run with a stepwise selection procedure based on the optimization of the Akaïke criterion. Because AN subtype and age at admission seemed clinically relevant to explain dropout, they were forced into the model. The initial set of explanatory variables included in the model was determined using three sources: 1/ 15 predictors of dropout found in bivariate analysis; 2/ 4 variables presented in the literature as predictive factors of dropout but not significant in our bivariate analysis; 3/ 5 variables deemed clinically relevant to the model by an expert (blinded to bivariate analysis results) and not selected by the two other models. The experts were C. Foulon and N. Godart. C. Foulon is a senior psychiatrist with 20 years' experience in the ED field. She worked in the ED unit from 1989 to 2007. N. Godart is a psychiatrist with 15 years' experience in another ED unit; she works both as a clinician and in Inserm unit U669. Dr Godart is independent from CMME.

Finally, early (<1 week) and later dropouts were compared, using Student's *t*-test and chi-square tests.

3. Results

3.1. Sample characteristics (Table 1)

All 601 patients were included. The table presents the patients' characteristics at admission according their AN subtype. Minimum lifetime BMI was significantly lower and the mean length of stay significantly longer for AN-R compared to AN-B/P inpatients. AN-B/P inpatients had made more than twice as many suicide attempts as R patients (for details, see Fedorowicz et al., 2007). AN-B/P inpatients more frequently had at least one child. Rumination, water intake, regurgitations, and substance use were significantly more frequent among AN-B/P inpatients. The comparison between AN-R and AN-B/P did not show any difference on BMI at admission, ED duration, "not being single", age at hospitalization or educational status (Table 1).

3.2. Dropout (Table 2)

Dropout from hospitalization concerned 53.3% overall, 50% AN-R and 56.2% AN-B/P (NS). See Table 2. Dropouts had lower discharge BMI (AN-R: 16.0 *vs* 19.6, $P<10^{-3}$; AN-B/P: 16.7 *vs* 19.7, $P<10^{-3}$) whereas no difference was found for admission BMI. Length of stay was shorter in case of dropout (AN-R: 6.9 *vs* 16.7 weeks; AN-B/P: 5.4 *vs* 13.7; $P<10^{-3}$ for all pairwise comparisons).

3.3. Bivariate analysis (Table 3)

Patients over 25 at admission (ORa=1.46) and with longer ED duration (ORa = 1.03) dropped out significantly more frequently. Other variables associated with increased probability of dropout include: not being single (ORa = 1.74), having one child or more (ORa = 3.16). Lower educational status was also related to dropout: when inpatients with secondary school status were compared to university level inpatients, an ORa of 2.04 was obtained. Regular use of laxatives and diuretics was significantly protective from dropout: ORa = 0.36 and 0.70, respectively. Higher minimum BMI (ORa = 0.91) and higher desired BMI (ORa = 0.84) were also protective from dropout.