

AGGRESSION AND IMPULSIVITY WITH IMPULSIVE BEHAVIOURS IN PATIENTS WITH PURGATIVE ANOREXIA AND BULIMIA NERVOSA

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SUMMARY

Background: The study aimed to compare purgative anorexia and bulimia nervosa patients in regard of their level of aggression and impulsivity traits, as well as dynamics of selected impulsive behaviours over time-course of eating disorder treatment.

Subjects and methods: 30 females with purgative anorexia nervosa, 33 females with purgative bulimia nervosa and 31 controls were included. Impulsive behaviours were assessed upon hospital admission, discharge, and three and six months after, using the internal ward questionnaire. Aggression and impulsivity traits were evaluated three months after discharge using Buss-Durkee Hostility Inventory and Barratt Impulsiveness Scale, 11th Revision.

Results: In all patients, the expressed impulsive behaviours were most frequent upon admission, when bingeing, striking and quarrelling were more expressed in bulimic patients. Later, patient groups did not differ regarding any impulsive behaviour. These all substantially resolved till discharge, and showed further decline at later assessments. All patients had a higher level of aggression and impulsivity traits and lower overt and higher covert aggression than controls. Patient groups had similar within group distribution of aggression and impulsivity intensity levels. Regarding individual dimensions of these traits no difference was found between them, except for the higher level of suspiciousness in anorectic individuals.

Conclusions: Purgative anorectic and bulimic patients show similar dynamics of impulsive behaviours which substantially decline over time-course of eating disorder treatment. They both present similarly heightened levels of aggression and impulsivity traits, with some minor differences regarding their individual dimensions, possibly reflecting higher overt aggression in bulimic and higher covert aggression in anorectic patients.

Key words: anorexia nervosa - bulimia nervosa - eating disorders - bingeing-purging subtypes – aggression – impulsivity - impulsive behaviour

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INTRODUCTION

Anorexia (AN) and bulimia nervosa (BN), together with other forms of eating disorders (ED), represent a significant contemporary medical problem and an important public health issue. Because of the strikingly resistant nature of these conditions, with AN still being placed among disorders with the highest mortality rate in psychiatry, the therapeutic management of eating disordered patients represents one of the biggest challenges in this field (American Psychiatric Association 2003). The key factors influencing the course and outcome of AN and BN are type of ED itself, as well as type and intensity of accompanying psychopathology. Most commonly it comprises anxiety and depressive disorders, as well as disorders with various impulsive behaviours, reflecting dysfunctional aggression and impulsivity (Blinder et al. 2006, Treasure et al. 2010). The presence of accompanying psychic disturbances is a rule rather than the exception in AN and BN patients and they constitute an important basis for poor therapeutic successes and prognosis of ED. Furthermore, it has been suggested that they even may prove a better predictor of clinical variables (i.e., response to

treatment, clinical course) than ED diagnoses themselves (Le Grange et al. 2008). Therefore, in order to improve diagnostic and therapeutic approaches in these patients, a better understanding of nature and dynamics of associated psychic disturbances, as well as of their interrelationships with the ED diagnoses themselves, is of significant importance.

In many cases of AN and BN patients common psychic disturbances (i.e. anxiety, depression, aggression and impulsivity) represent permanent personality traits, while in some patients they are of secondary nature and regarded as transient psychopathological states, causally related to ED itself or not (Blinder et al. 2006). Personality research on these patients revealed that an important role in the pathogenesis of ED itself as well as in its relapses may be attributed to heightened aggression and impulsivity, frequently reported in AN and BN patients. However, compared to healthy controls, AN and BN patients present higher levels of covert and subnormal levels of overt aggression (Blinder et al. 2006). Even though heightened aggression and impulsivity may emerge as a mere consequence of repeating bingeing-purging and/or starvation alone (Steiger et al. 2001) or conflictive and

hostile home environments (Eizaguire et al. 2004), in most patients with AN and BN they are found to be important personality traits. Causally they are often related to early childhood abuse (Preti et al. 2006), and are especially prominent in bingeing-purging subtypes of AN or BN (Dawe & Loxton 2004, Wonderlich et al. 2004). Still, most of the studies find aggression and impulsivity more expressed in patients with BN compared to those with AN (Truglia et al. 2006). In AN and BN patients they are highly correlated with the difficulty in expressing anger, which together with the lack of impulse control may lead to different forms of intense self-destructive impulsive behaviours (Selvini-Pallazoli 1996, Tibon & Rotschild 2009). Among them, most characteristic are bingeing unrelated to ED, psychoactive substance abuse, including alcohol, provocative behaviour and quarrelling, fighting, stealing, excessive spending of money, self-injurious behaviour, suicidality and participating in risky and reckless sexual engagements (Fisher et al. 2008). Such behaviours are more frequent in BN patients, who also are characterized by higher levels of novelty seeking, risk taking and overt aggression. In contrast, in patients with AN, a domination of covert aggression, high level of harm avoidance, strong need of approval and praise, as well as low level of risk taking were found (Vigil-Colet et al. 2008). However, lately suggestions have been made that in regard of both, ED symptomatology (especially from the course-related point of view) as well as concomitant psychic disturbances, patients with bingeing-purging subtypes of AN and BN may in fact be much more similar than patients within AN or BN diagnostic category itself - a premise with important diagnostic and therapeutic clinical implications (Wonderlich et al. 2007, Claes et al. 2010). In order to overcome known limitations of current ED classification system (e.g. DSM-IV), many authors have taken a more sophisticated statistical approaches (latent profile analysis or cluster analysis) trying to identify subgroups of eating disordered individuals based on a more comprehensive set of personality traits (Wonderlich et al. 2007). These studies have consistently identified three clusters of ED subjects on the basis of personality traits, largely independent of ED diagnosis: emotionally dysregulated or impulsive, emotionally constricted or compulsive and normative. The clusters differ on etiologic variables, ED and comorbid psychopathology symptoms, overall level of functioning, treatment history and momentary mood and behaviour ratings (Espelage et al. 2002, Peterson et al. 2010). Thus, even within ED diagnostic categories there may be varying patterns of psychopathology with meaningful scientific and clinical implications. Similarly, studies of impulsivity among ED patients suggest that a more fruitful approach in determining interrelationships between personality and ED with concomitant psychic disturbances would be to distinguish between ED patients characterised by a loss of control over eating (i.e. bingeing-purging AN and

BN) and ED patients characterised primarily by an obsessive over-control of food intake (i.e. restrictive AN) (Dawe & Loxton 2004, Cassin & von Ranson 2005, Fisher et al. 2008).

In line with these suggestions, our study aimed to investigate expected similarities and possible differences in aggression and impulsivity between bingeing-purging subtypes of AN and BN patients. Specifically, we aimed to evaluate the level of aggression and impulsivity as personality traits of these patients, as well as to study the dynamics of selected impulsive behaviours over time-course of ED treatment.

SUBJECTS AND METHODS

“p” Subjects. The study included 50 patients with AN (purgative subtype) and 50 patients with BN (purgative subtype), diagnosed and treated at the Eating Disorders Unit of Ljubljana Psychiatric Clinic (EDU) between January 2006 and January 2008. For the control group, 50 demographically matched healthy participants were invited to participate in the study. All patients and healthy participants were females. In patient groups, the inclusion criteria were as follows: a clear diagnosis of AN (purgative subtype) or BN (purgative subtype) according to DSM-IV criteria (American Psychiatric Association 1994) and a stable physical condition with the body mass index of more than 12 kg/m². Mean body mass indexes in AN, BN (in both at the admission to the hospital) and control group were 15.10 (kg/m²) (SD = 2.12), 21.33 (kg/m²) (SD = 2.73) and 22.6 (kg/m²) (SD = 3.2). The exclusion criterion in all study groups was age under 17 years. In the control group individuals with any psychiatric disturbance or serious somatic or neurological disease were excluded. In the patient groups however, exclusion criteria were any psychiatric co-morbidity (other than those under study investigation), mental disorder due to a general medical condition or serious somatic or neurological disease.

20 AN and 17 BN patients as well as 19 healthy participants were excluded from the study upon exclusion criteria, leaving a total number of 30 AN patients, 33 BN patients and 31 healthy participants to enter the study. The later were included only for the assessment of aggression and impulsivity traits in the patient's remission phase of ED. There were no dropouts of patients in either patient group during hospitalization. However, in a period between the third and sixth month after discharge 4 AN patients (1 for somatic disease, 3 for poor compliance) and 3 BN patients (2 for somatic disease, 1 for poor compliance) were excluded, leaving the number of 26 AN and 30 BN patients for the assessment of impulsive behaviours at the sixth month after discharge from the hospital.

The study groups were matched according to age (the average age of AN patients was 23.8 (SD 4.7) years, of BN patients 25.0 (SD 4.9) years, and 23.3 (SD

1.9) years in the control group) ($F(2.98) = 0.41$; $p=0.67$). Regarding other demographical data, the study groups were comparable as well (years of education ($F(2.98)=0.02$; $p = 0.98$), employment ($F(2.98)=2.57$; $p=0.08$), household ($F(2.98)=1.95$; $p=0.82$)); the possibility of type I error was excluded using the univariate Newman-Keuls Test (critical ranges 0.10-0.22).

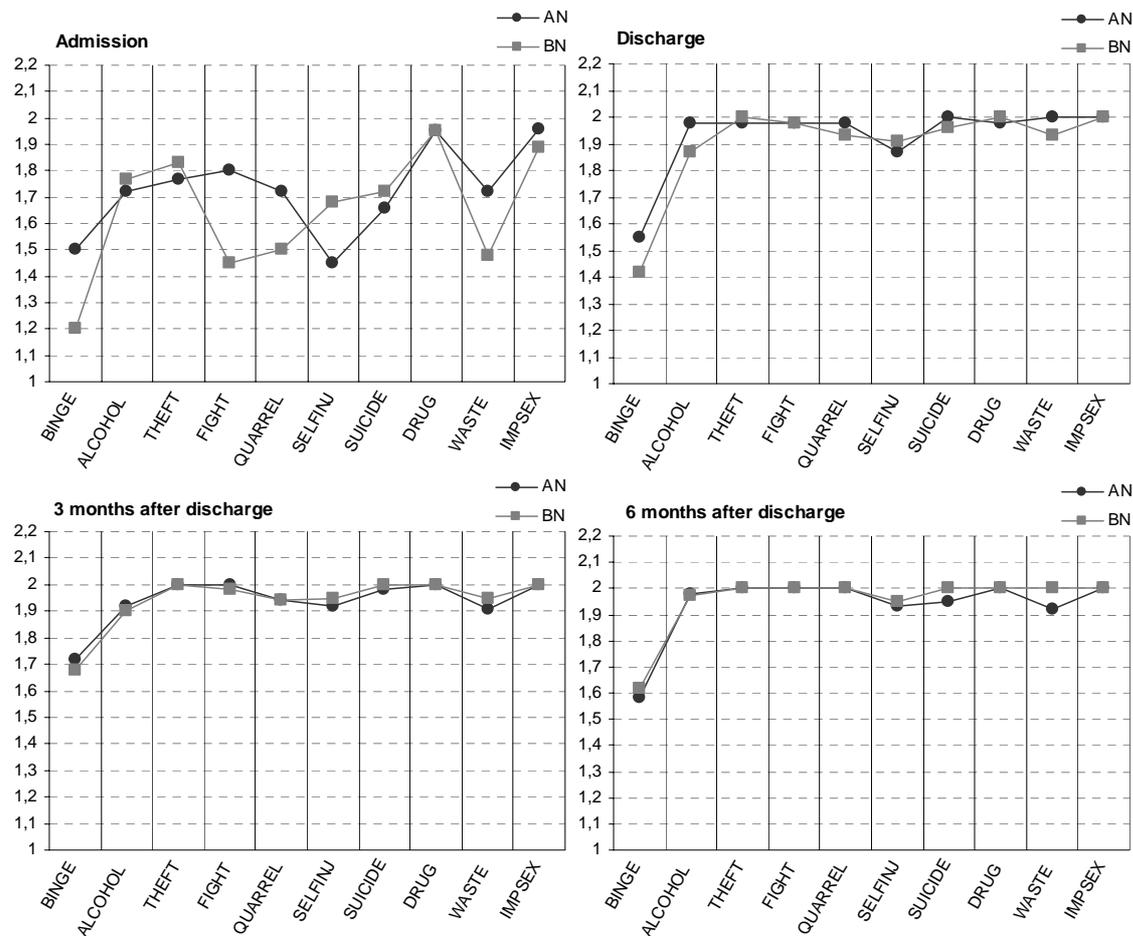
The EDU treatment protocol comprises four stages: ambulatory psychiatric and motivational support, hospitalization (usually lasting three to four months, divided into symptomatic, psychodynamic and social reintegration stage), daily clinic psychiatric management and further outpatient psychotherapeutic group management. The overall treatment duration depends less on ED type itself and more on individual psychic developmental delay.

All participants signed an informed consent after appropriate oral information. The study was approved by the National Medical Ethics Committee of the Republic of Slovenia.

“p” Methods. All assessments were obtained by an experienced and trained psychiatrist in a quiet ambulatory environment.

Dynamics of selected impulsive behaviours over time-course of ED treatment was assessed by the presence or absence of such behaviours at admission, at discharge and three and six months after discharge. Impulsive behaviours, most characteristic of patients with ED (bingeing unrelated to ED, alcohol abuse, thefts in shops or other places, fighting, quarrelling, intentional self-injury, suicidal behaviour, psychoactive substance abuse, excessive spending of money and impulsive sexual activities) were evaluated using the internal Eating Disorder Unit Questionnaire (based on Herzog & Kamryn 2007).

To assess aggression and impulsivity as personality traits (and not as transitional states accompanying the acute phase of ED) they were assessed in the remission phase of ED, i.e. three months after discharge from the hospital, using Buss-Durkee Hostility Inventory (Buss 1957) and Barratt Impulsiveness Scale, 11th Revision (Patton et al. 1995).



LEGEND: “p” AN – anorexia nervosa group (n = 30); BN – bulimia nervosa group (n = 33); BINGE – bingeing unrelated to eating disorder, ALCOHOL – alcohol abuse, THEFT – thefts, FIGHT – fighting, QUARREL – quarrels, SELFINJ – self-injurious behaviour, SUICIDE – suicidal behaviour, DRUG – drug abuse, WASTE – wasting money, IMPSEX – impulsive sexual behaviour; impulsive behaviours are represented as dichotomised variables, where presence of a specific behaviour is marked by number “1”, whereas its absence by number “2”.

Figure 1. The presence of impulsive behaviours in purgative anorexia and purgative bulimia nervosa patients at individual assessments

Exceedingly high and low levels of aggression were defined as values higher and lower than control group mean $\pm 2xSD$ (Eckhardt, Norlander & Deffenbacher 2004). In the case of impulsivity, these three intensity levels were assessed according to criteria of Stanford et al. (Stanford, Mathias, Dougherty & Lake 2009) (normal – BIS-11 total score: 52-71; high – BIS-11 total score: ≥ 72 and low – BIS-11 total score: ≤ 51).

All variables were analysed using multivariate analysis of variance (MANOVA), enabling us to estimate the likelihood of differences between the individual study groups on the basis of a null hypothesis. The results are shown in the form of means with standard deviations and p values. Differences in comparisons were regarded statistically significant where p value was less than 0.05.

RESULTS

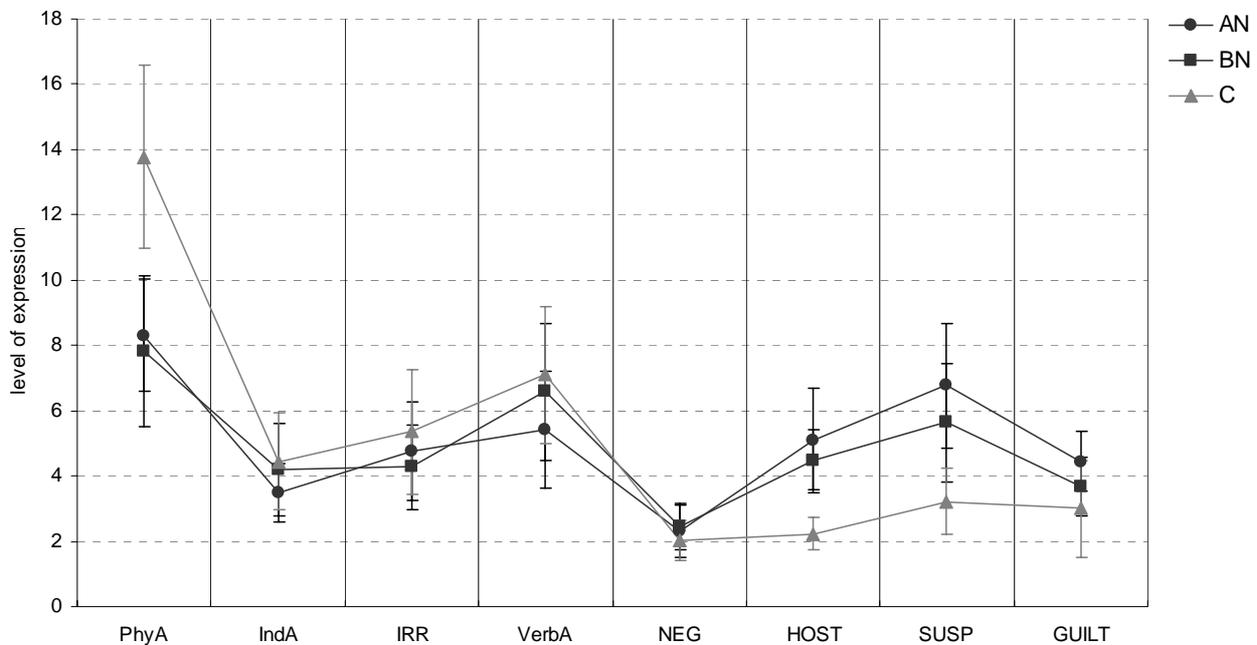
Impulsive behaviours

Of all studied impulsive behaviours, characteristic for AN and BN patients, only bingeing unrelated to ED ($F(2.66) = 9.3$; $p = 0.002$), fighting ($F(2.66) = 7.9$; $p = 0.006$) and quarrelling ($F(2.66) = 8.8$; $p = 0.004$) met statistically significant difference between the two patient groups, albeit only upon admission to the hospital. All three behaviours were more frequent in BN patients (Figure 1). In subsequent assessments no significant difference was observed regarding the presence of any studied impulsive behaviour between

the patient groups. In terms of bingeing, fighting and quarrelling, a trend of improvement and gradual disappearance was observed after discharge, as it was regarding some other studied behaviours as well (Figure 1).

Aggression

In the remission phase, i.e. three months after discharge from the hospital, aggression in both patient groups was significantly more intense than in the control group (RaoR (16.19) = 16.84; $p < 0.001$; Figure 2). Significantly lower levels of physical ($F(2.102) = 111.24$; $p < 0.001$) and verbal ($F(2.102) = 4.04$; $p = 0.02$) aggression and significantly higher levels of hostility ($F(2.102) = 18.12$; $p < 0.001$), suspiciousness ($F(2.102) = 29.47$; $p < 0.001$) and guilt ($F(2.102) = 3.73$; $p = 0.03$) were found in all patients compared with controls (Figure 2). Comparing patient groups a significant difference in aggression total score was observed (RaoR (8.65) = 2.13; $p = 0.045$), but only in regard to suspiciousness ($F(1.72) = 5.48$; $p = 0.02$), which scored higher in AN patients (Figure 2). After the introduction of arbitrary margins in BDHI total score (control group mean $\pm 2xSD$) in order to distinguish between different intensity levels of aggression trait in each study group, 33.3% of AN patients, 30.3% of BN patients and 6.4% of controls scored exceedingly high, while 3.3% of AN patients, 3.0% of BN patients and 3.2% of controls scored exceedingly low on BDHI total score.



LEGEND: "p" AN – anorexia nervosa group (n = 30); BN – bulimia nervosa group (n = 33); C – control group (n = 31); PhyA – physical aggression, IndA – indirect aggression, IRR – irritability, Verba – verbal aggression, NEG – negativism, HOST – hostility, SUSP – suspiciousness, GUILT – guilt

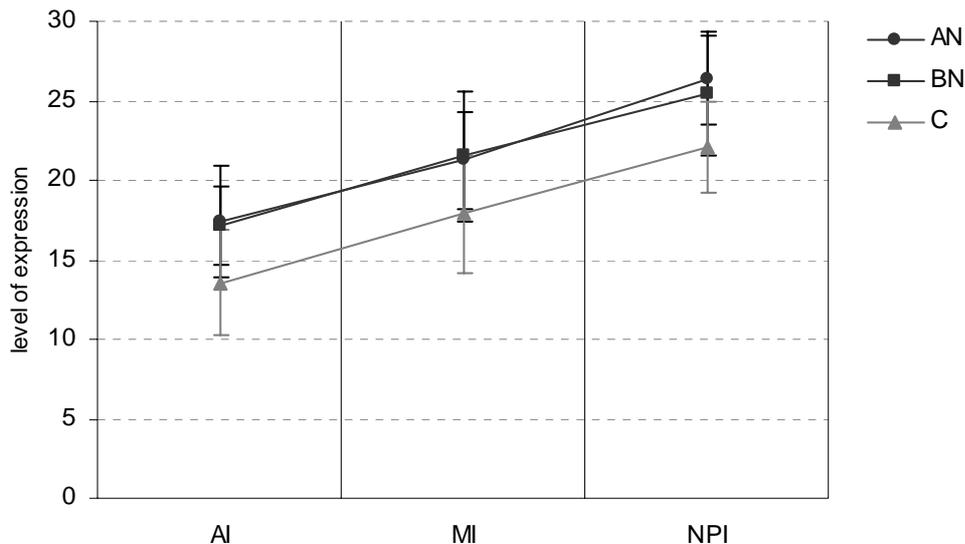
Figure 2. Aggression in purgative anorexia nervosa, purgative bulimia nervosa and control group three months after discharge from hospital

Impulsivity

Three months after discharge from hospital the level of impulsivity was significantly higher in both patient groups compared with controls regarding both its total score (RaoR (60.15)=3.14; $p<0.001$) as well as its individual categories (attentional impulsivity (F (2.77)=3.06; $p<0.001$), motor impulsivity (F (2.77)=3.83; $p<0.001$) and non-planning impulsivity (F(2.77)=3.98; $p<0.001$)) (Figure 3). Comparing AN and BN patients no significant difference was observed either in impulsivity total score (RaoR (11.62)=4.14;

$p=0.835$) or individual categories (attentional impulsivity (F(1.47)=1.18; $p=0.33$), motor impulsivity (F(1.47)=1.32; $p=0.21$), non-planning impulsivity (F(1.47)=1.18; $p=0.33$)) (Figure 3).

After the introduction of arbitrary margins in BIS total score in order to distinguish between different intensity levels of impulsivity trait in each study group, 33.3% of AN patients, 36.4% of BN patients and 3.2% of controls scored exceedingly high, while no AN or BN patients and 6.5% of controls scored exceedingly low on BIS total score.



LEGEND: “p” AN – anorexia nervosa group (n = 30); BN – bulimia nervosa group (n = 33); C – control group (n = 31); AI – attentional impulsivity; MI – motor impulsivity; NPI – non-planning impulsivity

Figure 3. Impulsivity in purgative anorexia nervosa, purgative bulimia nervosa and control group three months after discharge from hospital

DISCUSSION

Suggested similarities between bingeing-purging subtypes of AN and BN can only partially be supported on the basis of the observed presence of studied impulsive behaviours and its dynamics over time-course of ED treatment alone. In both our patient groups, a substantial decrease in the prevalence of almost all studied impulsive behaviours was observed during the treatment period. Moreover, three and six months after discharge from the hospital most of them were even completely absent. Significant differences in the prevalence of studied impulsive behaviours between AN and BN patients were found only upon admission to hospital (bingeing unrelated to ED, fighting, quarrelling and excessive money spending, all with the higher prevalence in the BN patient group). In subsequent assessments no significant prevalence differences between patient groups were found regarding any studied impulsive behaviour. These results indicate that in both, purgative AN and purgative BN patients, the expression of characteristic impulsive behaviours is

substantially related to the time-course of ED treatment, and are in line with previous studies investigating the relationship between impulsive behaviours and ED symptomatology (Krug et al. 2008, Krug et al. 2009). Also, in AN and BN patients, the presence and intensity of impulsive behaviours apparently reflect dysfunctional management and expression of anger, a phenomenon which during the acute phase of AN or BN, especially in individuals with the bingeing-purging subtypes of these disorders, could aggravate substantially (Miotto et al. 2008). Still, regarding some impulsive behaviours an important difference between patient groups was observed in our study. Upon admission to hospital there was significantly higher prevalence of bingeing unrelated to ED, fighting, quarrelling and excessive money spending in BN patients compared to those with AN. These are behaviours known to reflect higher levels of overt aggression, sensation seeking and risk taking, all characteristic for patients suffering from BN (Vigil-Colet et al. 2008). Thus, some important differences may still exist between purgative AN and purgative BN patients.

A much higher degree of similarity was observed in the comparison of aggression and impulsivity assessed in the remission phase of ED, i.e. three months after discharge from the hospital. In all patients aggression and impulsivity were found to be significantly more intense compared to healthy controls. These results are in line with several previous findings of heightened impulsivity and aggression in bingeing-purging subtypes of AN and BN (Ahren-Moonga et al. 2008, Miotto et al. 2008). This, together with findings of higher obsessiveness, perfectionism, rigidity, and harm avoidance in restricting anorectic individuals, represents an important avenue supporting the distinction between primarily binge-purging eaters and primarily restrictive eaters (Dawe & Loxton 2004). However, even though aggression and impulsivity are regarded as dimensional and not categorical (Vigil-Colet et al. 2008), comparing mean scores of the study groups alone may provide misleading results with potentially important scientific and clinical implications. The introduction of arbitrary margins in order to distinguish between different intensity levels of aggression and impulsivity helps to identify differences between the study groups on a more individual basis (Eckhardt et al. 2004, Stanford et al. 2009). In our study only approximately one third of patients in each ED group scored high on these two measures. Still, compared to controls a substantially higher number of individuals with heightened level of aggression and impulsivity was observed in both patient groups. According to state-trait investigations of psychic disturbances characteristic of ED patients, it is possible, that heightened disturbances exist as transient states in some patients, accompanying the acute phase of ED and disappearing during its remission (Blinder et al. 2006), which could explain the relatively low percentage of heightened aggression and impulsivity observed in our patients. However, such investigations in bingeing-purging subtypes of AN and BN patients are scarce, and mostly report aggression and impulsivity as traits in a substantial proportion of these patients, as well as a higher percentage of such individuals in BN patients compared to that in patients with AN (Dawe & Loxton 2004, Wonderlich et al. 2004). Never-the-less, considering limitations of self-rating questionnaires for personality features and psychic disturbances, limitations of aggression and impulsivity measures used in our study and a very scarce number of publications regarding categorization of these traits (Eckhardt et al. 2004, Stanford et al. 2009), the interpretation of these findings is difficult and caution is needed.

Regarding assessment of aggression dimensions all patients scored significantly lower in physical and verbal aggression, while having significantly higher scores of hostility, suspiciousness and guilt compared to controls. These results are consistent with the finding that anger suppression and internalization is an important characteristic of AN and BN patients, resulting in heightened covert and subnormal overt

aggression (Eizaguirre 2003, Truglia et al. 2006). Patient groups differed only in suspiciousness, which scored higher in AN patients. In the same way as with our results observed in impulsive behaviours, this finding could reflect higher levels of covert aggression, more characteristic of AN patients (Vigil-Colet et al. 2008). Still, such discordance would also be expected in other categories of covert aggression. Regarding impulsivity however, all patients scored significantly higher in all three dimensions (i.e. attentional, motor and non-planning impulsiveness) compared to controls, while between AN and BN group no difference was found. Thus, the results of aggression and impulsivity assessment in the remission phase of ED generally support observations of an important similarity between bingeing-purging AN and BN subtypes. Such findings may have considerable clinical implications, since heightened impulsivity predicts poor treatment success. Alternative and more individualized treatment options are already being considered for such patients (Wonderlich et al. 2007). However, more comprehensive studies are needed, which among other possible variables could include evaluation of other psychic disturbances, personality measures, and possibly more advanced statistical analysis, in order to establish a firmer distinction between bingeing-purging and restricting subtypes of EDs.

CONCLUSIONS

Patients with purgative anorexia and bulimia nervosa present several important similarities regarding aggression and impulsivity. They show similar dynamics of common impulsive behaviours which substantially decline over time-course of eating disorder treatment. Both patient groups present heightened aggression and impulsivity traits, as well as similar within group distribution of their intensity levels. However, some differences in aggression and impulsivity with impulsive behaviours still exist between these patients, possibly reflecting higher overt aggression in bulimic and higher covert aggression in anorectic patients.

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