

## Multifactorial aspects of eating disorders

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*The present study reports on the analysis of multifactorial determination of eating disorders and significant weight gain in anorexic patients subsequent to neuroleptic treatment.*

*Key words:* etiologic aspects, eating disorders, treatment

### Introduction

Eating disorders are a serious medical and social problem throughout the world, especially in Europe and North America. The number of publications in the professional literature addressing this problem is on the increase [1, 2, 3, 8, 9, 10, 13, 14, 22, 31].

The subclassifications of eating disorders include: anorexia nervosa, bulimia nervosa, compulsive overeating, morbid obesity and ploidypsia nervosa.

The incidence rate of anorexia nervosa and bulimia nervosa fluctuates, with rates increasing and decreasing according to different authors (0.7% - 1% and 0.9% - 2.5%). It must be stressed, however, that a precise estimation of the scale of this phenomenon is difficult to determine due to the application of varying diagnostic criteria and to the fact that many patients are treated by endocrinologists, pediatricians, and neurologists. It is estimated that the actual number of individuals suffering from eating disorders, especially from bulimia nervosa, is much more frequent than that of individuals receiving medical treatment. However, certain positive changes can also be observed. For instance, patients tend to seek medical treatment after a shorter duration of disorders. This fact may support therapy and influence a more successful prognosis [9, 13, 14, 30]

Eating disorders constitute a model of psychosomatic disorder [4, 5, 24, 30] conditioned by numerous factors [15]. Most often they affect adolescent females and young women, as opposed to adolescent and adult males [20, 21]. Treating eating disorders is often quite arduous. Anorexia nervosa in particular is considered to be the most dangerous, since it may incur sudden death during periods of well-being and fairly good psychophysical activity.

Anorexia nervosa was first recognised in 1714 by an English physician W. Morton, even though it was mentioned as early as the Middle Ages [15]. Bulimia nervosa was first identified in 1979 by S. Russell, and then more precisely defined by subsequent classifications of the American Psychiatric Association [6,15,18].

Multifactorial determinants of eating disorders comprise several aspects: biological [11, 15, 16], social [14], cultural [7] and psychological [3, 12, 15]. Among the biological factors that are given the greatest consideration are genetic determinants. The incidence rate of eating disorders in monozygotic twins ranges from 35% - 15%, in dizygotic twins - 14%, with relatives of the first degree 5% - 10% (Holland, Sicotte, Treasure 1988, Las 1993; cit. after [15]). Other factors taken into consideration include birth defects of hunger regulatory centers and reproductive functions of the hypothalamus in adolescence. In addition functional inborn sensitivity of hypothalamus manifesting itself in stress situations [11, 15, 16] as well as dysregulation of hypothalamus-hypophysis-adrenal gland axis is also strongly considered.

On the biochemical level, the role of neurotransmitters and neuromodulators [corticotropin releasing factor - CRF, vasopressin] is examined due to the association of disturbances in anorexia nervosa with disorders of noradrenergic, serotonergic and opioid systems. These disorders may also stimulate the occurrence of symptoms accompanying anorexia nervosa such as anxiety and depression. In bulimia nervosa disturbances in serotonin and noradrenaline activity as well as decreased cholecystokinin secretion [11] are emphasised. More recently, attention has been given to the anorexogenic influence of the newly discovered neuropeptide acting similarly as CRF - urocortin [27]. The above mentioned neurochemical disorders have their implication in a pharmacotherapeutic approach and in the administration of compounds influencing neurotransmitters, [i. e., neuroleptics, tricyclic antidepressants, selective serotonin reuptake inhibitors, MAO inhibitors] [17, 29]. Also, the comorbidity of bulimia nervosa with affective disorders, obsessive-compulsive disorders and alcohol dependence have been analysed [15, 17, 25, 29]. Anorexia nervosa may be a complex symptom in the course of endogenous depression, schizophrenia and organic impairment of the central nervous system [CNS]. Most recently, morphological changes are found in the CNS. In computerized axial tomography [CAT] some authors have detected dilated white matter sulci, which normalised after weight gain. In turn, positron emission tomography [PET] have revealed higher glucose metabolism in the caudate nucleus, which also returns to a normal disposition subsequent to weight gain [11].

In recent years considerable attention has been attributed to cultural and social determinants [7, 13,14]. Analysis of familial characteristics emphasise dysfunctional family structure masked by rigidity, overprotectiveness, entanglement involving the child in parental conflicts which he/she is unable to solve. With these families the dissolution of boundaries exist between family subsystems and individual family members. A dangerous set of dynamics develop, and the symptoms play an essential role ensuring homeostasis within the family [Minuchin, Selvini Palazzoli] [15].

Numerous authors have also indicated that additional personality features play a major role. In particular are characteristics of anorexia nervosa, such as low self-esteem and an intensified need for success, difficulties in acceptance of oneself and

one's appearance, a sense of responsibility, conscientiousness, emotional dependence on parents, inclination to submit to others, and excessive ambition, perfectionism [3, 12, 15]. According to cognitive-behavioural theory an important role is played by anxiety which constitutes, a pivotal element of eating disorders [12, 15]. This anxiety often regards psychosexual maturity, against which females may defend themselves using autoaggressive behaviours. The multifactorial aspects of eating disorders determine multidirectional therapeutic approaches to these disorders, taking into account pharmacotherapy and a broad range of psychotherapy [17, 19, 23, 26, 28].

Recently, prognostication with eating disorders has been somewhat less pessimistic. It is believed that improvement occurs in 40-70%, chronic course of illness in 20% of cases, death rate in 5- years' follow-up amounts to 4.5%-5%, and in 15- years' follow-up – 15-23% [15]. In the case of bulimia nervosa treatment is estimated to bring improvement in approximately 30-60% of cases, but follow-up periods are too short and it is arduous to distinguish these results from the natural course of an illness.

The aim of this study was to analyse the course of anorexia and bulimia nervosa in the personality, familial, clinical and therapeutic aspects of the disorders. Factors influencing weight gain in individuals with anorexia nervosa have also been evaluated.

### **Instruments and methodology**

Patients diagnosed with eating disorders were treated in the period between 1972-1994 at the 1<sup>st</sup> Psychiatric Department of the Medical University in Gdańsk. During this period, 55 patients [52 females and 3 males] ranging in age from 12 to 39 years [ $x = 21.2 \pm 5.9$ ] were treated for eating disorders diagnosed according to the DSM-IV criteria. 51 individuals were hospitalised with a diagnosis of anorexia nervosa, 4 individuals with bulimia nervosa and 6 individuals with anorexia nervosa manifested bulimic type episodes (binge eating type according to DSM-IV). The distribution of those assigned clinical diagnoses in the examined group of patients is portrayed in Fig.1.

Case records together with necessary additional examinations were submitted as part of the criteria analysed. Separate interviews were conducted with family members of patients. A statistical analysis was performed with the use of a license package SPSS/PC+, for Windows version 7.0 (c. SPSS inc. 1989-1995).

### **Results**

Symptoms of anorexia nervosa were accompanied by the following mental disturbances according to DSM-IV. Scores involved major depression, one case of dysthymic disorder, and four cases involving a diagnosis of borderline personality disorder. Bulimia nervosa was detected in young females only, and occurred within the last two years. Bulimia nervosa was accompanied by distinct personality disorders on Axis II.

In the years 1972-1988, the patients with eating disorders constituted 0.33% of

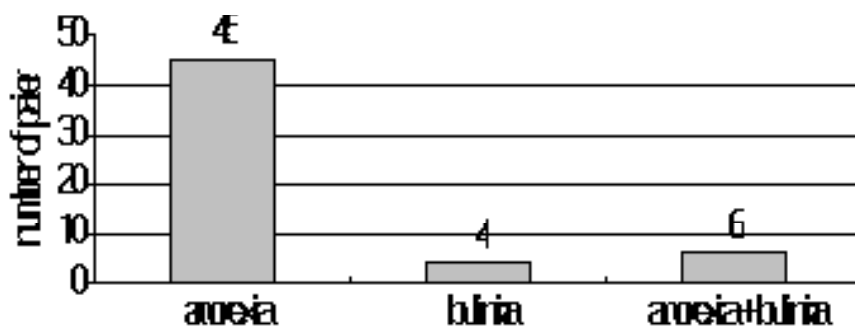


Fig. 1 Diagnoses

all hospitalised individuals, while in the years 1989-1994 this proportion increased to 0.45%.

Duration of illness ranged from 1 to 14 years [ $x = 2.92 \pm 2.82$ ]. Duration of illness was distributed as follows: up to 1 year – 13 cases [23.6%]; 1-2 years – 21 cases [38.2%]; 3-4 years – 13 cases [23.6%]; 5-6 years – 3 cases [5.5%]; more than 6 years – 5 cases [9%] 15 patients [27.2%] had received treatment through the Department of Internal Medicine, endocrinological or pediatric wards prior to being admitted to the Psychiatry Department.

8 individuals, i.e., 14.5% received general medical treatment. The number of hospitalisations ranged from 1 to 4 [ $x = 1.7 \pm 0.89$ ]. School age females and students prevailed among the patients. 30 persons [54.5%] were less than 20 years of age; 45 [81.8%] were younger than 25; only 5 persons [9%] were more than 30 years of age. 18 persons [32.7%] possessed elementary education; 35 persons [63.6%] – incomplete secondary, secondary or incomplete university education; 2 persons [3.6%] – university degree. 9 patients [16.4%] were employed, 6 persons [10.9%] were non-working, including 2 patients who received unemployment compensation and one with a disability

Table 1 Demographic data

Age	12-20 years	20-25 years	Over 25 years
N	30	15	10
Education	Elementary	Incomplete secondary, secondary, incomplete university	University degree
N	18	35	2
Marital status	Single	Married	Divorced, widowed
N	46	7	2

ability pension. 7 females were married, 1 was divorced and 1 widowed.

In 13 cases [23.6%] the patients came from single parent families. In 5 cases the father had died, mother had died in 1 case; in 7 cases the parents were divorced [fathers had left the families]. In 28 cases the patients were the eldest children in their families [50.9%]; in 16 cases [29%] they were the only children. In 8 cases [14.5%] the patients were born after pathological pregnancy, in 7 cases [12.7%] there occurred dystocia,

5 patients had suffered from head injuries with loss of consciousness [9%].

A family history of mental disorders was revealed in 11 cases [20%]: 1 case involved a schizophrenic mother, in another a father suffering from endogenous depression in 4 cases in which the fathers were alcohol dependent; in 2 cases it was mother's and brother's neurosis, in 1 case mental disorders were not clearly defined and regarded more distant relatives, in 1 case it was the suicide of a relative.

During the course of the data analysis there was a relatively high distribution of biological factors, regarding 20 patients [36.7%]. Due to this fact, varying examinations were conducted concerning possible organic change in the CNS. These examinations were conducted on 37 patients [67.2%]. They included skull- X ray's, EEG's, CAT's, psychological and neurological examinations. In 2 cases [3.6%] skull-X ray's showed a thickening of the inner table of the frontal bone [hyperostosis frontalis interna]. 31 individuals were administered EEG examinations[56.3%].In 11 cases the record manifested features of general pathology [20%], in 2 case- paroxysmal changes. In 3 cases [5.4%], CAT of the head indicated pathology [cortical atrophy in 2 cases and subcortical atrophy in 1 case]. In psychological examinations, pathology of the CNS was suspected in 10 cases [18%]; in 4 [7.2%] cases distinct pathology was detected. Neurological examinations indicated symptoms of disseminated damage of the CNS in 6 cases[10.2%].

The examinations described above revealed coexisting "organic" deviations in the CNS in 20 patients [36.7%]. It is not easy to explain this phenomenon, since no objective data concerning the condition of the CNS prior to the onset of the disease was available. However, because duration of illness was too short, a possibility of "organic" predisposition to eating disorders was considered as opposed to the detected changes in the CNS with hyponutrition [hypovitaminosis]. Several factors present in the data [pathological pregnancy, dystocia, head injury], which could have led to organic injury of the CNS, might have influenced the results of the research.

11% of patients came from single parent families (i.e., from families that did not provide complete models for formation of proper identification with sex or ensure the feeling of safety). Parental conflicts occurred in 25 cases [45%]. In 2 cases the problem consisted of the father's alcohol dependence, and in the other 2 – in physical aggression on the father's part. In the remaining cases the most frequent problems involved overprotective mothers and withdrawn fathers were often absent due to occupational responsibilities. In 2 cases the family functioning was seriously effected by neoplastic disease or mental illness of one of the parents. In 8 cases [14.5%] there were distinct conflicts between parents dissatisfied with their relationship. This may have involved their children in the solving of their marital problems. Competition between siblings were detected in 5 cases [9%]; which often occurred after the birth of a new-born. Family conflicts of married women were revealed in 9 cases [16.4%] of women dissatisfied with their relationships. Other conflict situations included school problems connected mostly to adaptation in new environments [change of school, sneering on the part of school mates at their weight condition], and unhappy relations with members of the opposite sex.

In the analysis of personality features in clinical and psychological examinations [Minnesota Multiphasic Personality Inventory-MMPI; Rorschach], anxiety prevailed in 30 individuals [54.5%] and egocentrism in 35 [63.6%]. These symptoms were most

likely connected to poor family configurations and an increased sensitivity to stressful circumstances. Other features observed in the patients included: obsessive-compulsive behaviours- in 11 individuals [20%], depressive symptoms- in 6 individuals, passive-dependent, passive-aggressive, and histrionic personality as well as difficulties in

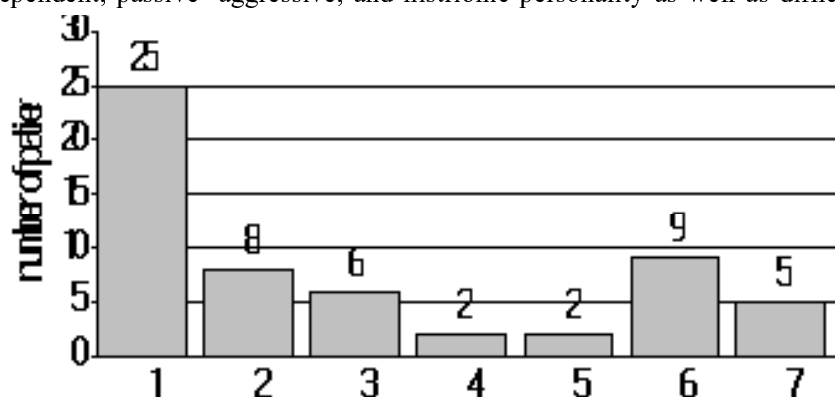


Fig. 2 Family determinants

acceptance of one's own sex- in 10 persons [18%], infantilism.

1 – conflicts with parents; 2 – conflicts between parents; 3 – single parent family; 4 – physical aggression; 5 – father's alcohol dependence; 6 – conflicts with the spouse; 7 – conflicts with siblings.

Regression, repression, withdrawal, rationalisation and conversion as well as a distinct tendency to manipulate the environment dominated among the defence mechanisms.

The applied treatments included individual and group psychotherapy for 34 individuals [61.8%], antidepressant medication for 22 individuals [40%], and administration of neuroleptics to 21 individuals [38%]. The criterion for qualifying patients for antidepressant medication consisted of clinical recognition of depressed mood, independently of other accompanying symptoms. The thymoleptics applied in therapy included amitriptyline, doxepin, opipramol, mianserin, clomipramine and fluoxetine in therapeutic doses administered during treatment. Neuroleptics included chlorpromazine, perazine, promazine, sulphiride, thioridazine in doses half as high as in treatment of schizophrenic conditions. Neuroleptics were administered to patients with increased irritability and anxiety, sleep disturbances and aggressiveness. In addition, benzodiazepines and insulin in appetite stimulating doses were administered immediately. In some cases patients also received compound electrolyte solutions, albumin and iron to supplement serious deficits.

In bulimia nervosa, we applied selective serotonin reuptake inhibitors. In no case was psychotherapy the only method of treatment.

As can be seen in Table 2, the mean weight gain achieved during treatment was  $2.8 \text{ kg} \pm 2.4 \text{ kg}$ .

With regard to improvement of mental condition, stabilisation was achieved with mood; along with a decrease of anxiety; improvement of sleep, especially in its 1<sup>st</sup>

phase; alleviation of irritability, fatigability, obsessive thinking about food and feeling of guilt. This estimate was made on the basis of data obtained from medical records.

Table 2

Variables analysed in the examined material

	N	Minimum	Maximum	Mean value	SD
Duration of illness in years	55	1.00	14.00	2.9273	2.8275
Number of hospitalisations	55	1.00	4.00	1.7818	0.8953
Proper body weight minus weight after treatment	55	-15.30	23.40	8.9564	6.9407
Proper body weight minus weight before treatment	55	-15.30	26.30	11.6145	7.2360
Weight gain after treatment	55	0.00	10.00	2.8656	2.4183
Proper body weight	55	42.00	72.00	54.0400	4.9248
Weight after treatment	55	31.50	66.00	44.8618	7.0494
Age	55	12.00	39.00	21.2545	5.9105

In some cases, family relations improved, however, an objective assessment of these changes was not possible.

Statistical analysis with the use of Student-t test for related groups revealed statistically significant weight gain subsequent to treatment [ $p < 0.01$ ]. Conversely, no statistically significant correlation was obtained between duration of illness, number of hospitalisations, antidepressant medication, psychotherapy and weight gain. Results

Table 3

Correlation between body weight and applied medications

		Antidepressants	Neuroleptics	Weight gained after treatment
Pearson's Correlation	Antidepressants	1,000	-0,183	0,146
	Neuroleptics	-0,183	1,000	-0,415**
	Weight gain after treatment	0,146	-0,415*	1,000
Significance Level (two-sided test)	Antidepressants		0,180	0,289
	Neuroleptics	0,180		0,002
	Weight gain after treatment	0,289	0,002	
		55	55	55
		55	55	55
		55	55	55

\*\* Correlation is significant at  $p < 0,01$  [2-tailed]

indicate, that patients receiving neuroleptics manifested highly significant weight gain [Table 3].

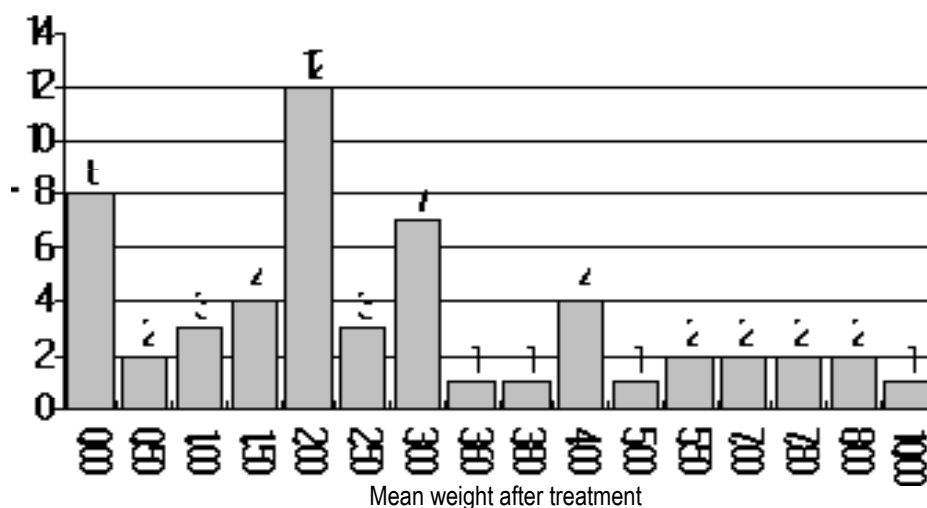


Fig. 3 Number of patients achieving definite weight gains

We found it impossible to confirm personality correlation with the result of treatment.

As Fig. 3 indicates, the largest number of patients (12) achieved a weight gain of 2 kg. The treatment results, however, cannot be reduced to this value. From a clinical and environmental perspective, the change of attitude towards eating, relinquishing “eating rituals”, improvement of one’s body schema, return of menstruation that does not always correlate with weight gain, is also important. In the patient population improvement was observed with the mental condition – calming, a decrease of anxiety and tension, and improvement of family relations. The patients acquired distance from their own pathological behaviour and ceased to focus their interest on the function of their digestive tract. It is worth mentioning that prior to hospitalisation most of the patients (83%) had been ineffectively treated on an outpatient basis.

It is inferred that the condition of success, apart from pharmacotherapy and psychotherapy, is a temporary [several weeks duration] isolation from family surroundings, breaking of the chain of incessant “negotiations” concerning body weight, food, appearance, mutual concessions and accusations, especially with the mother – daughter relations. It would be advisable to extend future research on psychopathological indices measured with appropriate standardised instruments in order to obtain a better evaluation of the treatment outcome in eating disorders.

The positive effects of neuroleptics, which significantly influenced body weight gain may be of particular interest. Perhaps, their impact on noradrenergic and opioid systems influences more effectively the levels of anxiety and auto-aggressive behaviours in anorexia nervosa. On the other hand, bulimia nervosa is connected – in the opinion of many researchers – with affective disorders and obsessive-compulsive disturbances. This may cause them to be more amenable to treatment with antidepressants. As a



result, it appears that anorexia nervosa and bulimia nervosa may have different etiological determinants, albeit with overlapping biological, psychological and socio-cultural influences. This requires further investigation on a larger scale, such as with the case of evaluation durability of therapy results in a longer follow-up period.

### General Conclusions

1. Determinants of eating disorders are multifactorial. They include biological factors [together with CNS injuries of different etiology], family pathology, personality pathology (anxiety-aggressive tendencies) as well as socio-cultural influences
2. Complex biological and psychotherapeutic treatment in hospital conditions proved to be effective.
3. Among biological methods applied in anorexia nervosa, neuroleptic treatment, which brought about significant weight gain, proved most effective. This result requires further investigation.

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