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Schizophrenia and anorexia nervosa – reciprocal relationships. A literature review

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Summary

Although schizophrenia and anorexia nervosa are seemingly very distinct psychiatric disorders, their symptoms are connected by various types of relationships. The present article reviews the literature and recapitulates the views of various authors on the links between these two disorders.

Symptoms of anorexia may 1) precede the onset of psychosis; 2) evolve in its active phase or more rarely manifest in remission; and, conversely, 3) psychotic symptoms may occur transiently in the course of anorexia nervosa. When anorexia precedes the manifestation of psychosis, symptoms of anorexia can be treated as a component of the prodromal phase of schizophrenia. Another possibility of co-existence of a psychosis (e.g., schizophrenia) with anorexia is when the eating disorder syndrome manifests at the same time as the full-blown psychotic syndrome. In such cases, when the symptoms of the two disorders occur simultaneously, it is often difficult to say whether the patient is suffering from schizophrenia, in the course of which anorexia has arisen secondary to psychotic symptoms or whether he/she is suffering from anorexia during which he/she has developed psychotic symptoms, usually thematically associated with eating.

Studies published so far, mainly case reports, point to the complex nature of the interrelationships between schizophrenia and anorexia nervosa. Further research is needed to con-

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clusively explain the relationships between psychotic disorders and anorexia nervosa, which would allow physicians to use more effective methods of treatment in this group of patients.

Key words: anorexia nervosa, schizophrenia, comorbidity

Introduction

The essence of the relationship between schizophrenia and anorexia nervosa is still unknown; although this subject recurs in the medical literature quite often, all the authors unanimously draw attention to the paucity of information and the need for further research [1].

Symptoms of anorexia are observed in 1–4% of patients with the diagnosis of schizophrenia [2], while in the general population the incidence of anorexia is estimated to be 0.3–1% [3]. In different studies, psychosis has been estimated to occur in 0 to 13% of patients with primary eating disorders [4, 5]. In the male population, in which cases of eating disorders are extremely rare, comorbidity with symptoms of schizophrenia is much more prevalent than in women and may be as high as 35% [6, 7].

Clinical observations indicate that anorexia nervosa and schizophrenia, though they differ entirely in their nature, etiology, pathogenesis, symptoms, course and prognosis, can manifest in one person one after the other, but can also be comorbid.

Anorexia may precede psychosis, manifest in its active phase or, less commonly, present in its residual phase [8, 9]. Sometimes, however, it is anorexia that is diagnosed as the primary disease with secondary psychotic symptoms. During the pre-psychotic phase of schizophrenia, patients may experience a variety of psychopathological symptoms and syndromes, unusual behavior and cognitive impairment. Anorexia nervosa is one of such abnormalities [10]. Another possibility of comorbidity of a psychosis with anorexia is when anorexia nervosa, diagnosable with the ICD-10 (BMI $\leq$ 17.5, self-induced weight loss, unrealistic picture of oneself as obese, fear of gaining weight, and endocrine disorders) [11], occurs simultaneously with symptoms of schizophrenia. In such cases, when the symptoms of the two disorders occur simultaneously, diagnostic difficulties may arise: are we dealing with schizophrenia, in the course of which anorexia arises secondary to psychotic symptoms or are we dealing with anorexia during which there appear psychotic symptoms, usually thematically associated with eating.

The remaining part of this article presents current views and experiences of various authors regarding the comorbidity of the symptoms of the two disorders. An attempt was also made at systematizing the available knowledge on the relationships between schizophrenia and anorexia nervosa.

Relationships between anorexia nervosa and schizophrenia: theories and hypotheses

Cases of schizophrenia occurring in conjunction with eating disorders caused by delusions have been described already by Bleuler [6]. In the past 30 years, several

authors have proposed theories, according to which anorexia could be considered a psychotic disorder. It has been suggested that some axial symptoms of anorexia could be related to psychosis and that body image disorders could arise due to delusions [12].

It has been noted, for example, that one disorder could morph into the other under the influence of often unspecified factors. Authors mention possible involvement of various factors causing high levels of stress or influence of drugs such as antidepressants used in the treatment of anorexia nervosa [13–15].

Basing their views on psychoanalytic theories, some researchers [1] believe that anorexia nervosa has an adaptive function, acting as a sort of defense against psychosis. To defend his/her weak ego against the surge of psychotic content, the patient creates an artificial "Self", identical with him/herself, which gives him/her a sense of control over the growing chaos, with the reservation that patients with psychotically organized personality face a constant danger of "sliding into a psychosis" [4, 15].

Seeman, in her article published in 2014 [1], listed as many as seven hypotheses on the reciprocal relations between schizophrenia and anorexia. The results of her deliberations are presented below:

1. Anorexia nervosa and schizophrenia constitute two independent disorders. Such a hypothesis predicts that the incidence of anorexia in patients with schizophrenia will be the same as it is in the general population and vice versa the incidence of schizophrenia among individuals with anorexia nervosa will be the same as it is in the general population. In a situation like this, the two conditions would have to be treated independently.
2. Psychosis can develop as a result of starvation caused by anorexia and, conversely, anorexia can develop as an effect of psychotic experiences. The prediction here would be that effective treatment of the primary condition would help eliminate both.
3. Control over eating gives a sense of power to individuals with a low sense of self-control, and poor self-control predisposes to both anorexia and schizophrenia. Control over food intake increases the sense of control over the situation in psychosis, and psychosis, in turn, may reduce the desire to rigorously follow a diet in anorexia. If this were the case, the treatment of one of the diseases would exacerbate the course of the other, because the defense mechanism would have been removed.
4. Eating disorders result from delusional body image distortions. Successful treatment of one disease would improve the course of the other.
5. One disorder precedes the other, and disappears once the primary condition has surfaced. Anorexia could then be thought of as a prodrome of schizophrenia.
6. Both disorders can be induced pharmacologically – some antipsychotics increase body weight and may thus predispose patients to excessive dieting. Conversely, antidepressants used to treat anorexia can trigger psychosis. If this were true, withdrawal of the aggressive treatment could improve the course of the secondary disease in both cases.

7. The occurrence of one disorder in the course of the other could be a marker of severity of the primary disorder – if this were the case, patients with psychotic symptoms would be more malnourished (BMI < 15), and patients with comorbid anorexia would manifest more severe psychotic symptoms and poorer response to treatment [1].

The multitude of hypotheses on the relationships between schizophrenia and anorexia nervosa undoubtedly point to the complexity of the problem.

Symptoms of anorexia during the prodromal period of schizophrenia

The prodromal period of schizophrenia can be defined as evident changes in behavior, psychopathological symptoms or syndromes recognized by the patient and/or relatives or caregivers which precede the onset of psychotic symptoms and whose number, severity and configuration allow a physician to diagnose schizophrenia according to ICD-10 or DSM-5 criteria [10]. The prodromal period can last from a few days up to several years, depending on the patient [16].

During the prodromal period of schizophrenia, patients may experience a variety of psychopathological symptoms and syndromes as well as unusual behavior and cognitive impairment. Anorexia nervosa is one of such abnormalities [17].

The possibility of anorexia developing as a prodrome of impending schizophrenia has also been noted by Powers et al. [12].

A study conducted by Rabe-Jabłońska et al. [10] among 150 patients aged 15–19 years showed that 2.7% of the patients (0.7% of boys and 2% of girls) manifested symptoms of anorexia during the prodromal period of schizophrenia. In the described cases, the time from the onset of a full-blown psychosis which met the ICD-10 criteria for schizophrenia (i.e., persisted for at least 1 month) had been no less than three months and no more than 24 months [10].

In another study, Brzozowska et al described three patients, two of whom were male. One of these patients exhibited traits of premorbid schizoid personality and the authors suggested that in that case the anorectic syndrome was actually part of the prepsychotic period [9].

There are also cases in which the symptoms of anorexia predominate in the prodromal period, then coexist with psychotic symptoms for some time from the start of a full-blown psychosis and eventually disappear completely in the course of schizophrenia [18].

According to observations made by Żechowski, in clinical practice it is not so unusual to encounter cases in which a catatonic episode was preceded by a period of anorexia nervosa [4].

Symptoms of anorexia manifesting in the active phase and in remission of schizophrenia

Symptoms of anorexia can also develop in patients with a diagnosis of schizophrenia – during or after a psychotic episode. Literature of the subject largely consists of case reports, which makes it difficult to draw unequivocal conclusions. The fact that the two disorders may manifest one after the other at a certain time interval, especially when psychotic symptoms precede the symptoms of anorexia, raises the question of whether there is a connection between them or whether they are two independent conditions [1, 19].

Lyketsos et al. [20] quoted data which showed that in two out of every five patients diagnosed with schizophrenia, eating disorders were related directly to the subject of their delusions, and in one-sixth of the patients they were associated with hallucinations. In approximately half of the patients, the symptoms were not associated with either impaired perception or impaired thinking.

Some authors [21, 22] suggest, on the basis of the characteristic features of the cases described by them (onset, course and specific symptoms of the disease), that comorbid schizophrenia and anorexia, despite reciprocal influences, are separate disorders.

Another approach to the relationship between eating disorders and schizophrenia is taken, among others, by Ferguson et al. [23]. Those authors believe that anorexia nervosa may be a way of adapting and organizing one's life so as to regain the sense of identity obliterated by schizophrenia.

Lai et al. [19] reported a case of a 13-year-old patient with early-onset schizophrenia who developed symptoms of anorexia. Interestingly, a year before the onset of symptoms of schizophrenia, the patient had begun to focus her attention on body weight and started a diet. Despite the initial diagnosis of schizophrenia, the clinical picture in the course of treatment was dominated by anorexic symptoms such as fear of gaining weight and constant weight control, i.e., symptoms which commonly occur in anorexia, but are rarely observed in schizophrenia. Finally, the patient was diagnosed with schizophrenia with a comorbid eating disorder. After a year of pharmacological therapy combined with psychosocial interventions, remission of both psychotic and anorexic symptoms was achieved.

A distorted body image is one of the basic symptoms of schizophrenia. It may predispose a patient to developing a whole spectrum of eating disorders [13].

An example which supports this hypothesis is the case of a patient described by Ruzyanei et al. [24]. A woman, who at the age of 17 had been diagnosed with schizophrenia with symptoms of comorbid anorexia, visited a physician ten years after discontinuation of pharmacotherapy with a dangerously low body weight and persistent psychotic symptoms. The main symptom in the whole course of the disease was the patient's refusal to eat. The woman wanted to retain the physique of a little girl, because she thought she was one. In such cases, a psychiatrist must face the following question: are the emerging signs of anorexia nervosa still symptoms belonging to the clinical picture of schizophrenia or do they constitute a separate clinical entity.

Another hypothesis seeking to explain the comorbidity of schizophrenia and anorexia is the claim that treatment of one condition is responsible for the development of the other. Antipsychotics used to treat schizophrenia often lead to weight gain during long-term pharmacotherapy, which may induce a fear of gaining weight that could potentially lead to a refusal to eat and future development of an eating disorder [1].

Another possibility is that anorexia and schizophrenia coexist in the same patient by chance. If this is true, there should be cases of patients who experience an interval without any psychopathological symptoms between the two disorders [1]. Although some studies describe patients who developed schizophrenia some time after the episode of anorexia [20], reverse cases of anorexia developing after the resolution of psychosis and an asymptomatic interval are reported extremely rarely [25], which makes the theory of a loose connection and independent psychopathology of these two disorders unlikely and difficult to prove.

Psychotic symptoms manifesting in the course of anorexia nervosa

Disturbances of thought content are the most frequent psychotic symptom of anorexia and one that constitutes the most important similarity shared with the clinical picture of schizophrenia. However, while in schizophrenia the entire thought process is impaired, in anorexia only selected aspects of it are disturbed, in particular those related to body image, body weight, diet and acceptance of treatment, with other aspects of the process remaining unaffected [12, 14]. In patients suffering from anorexia nervosa, disturbances of thought content may vary in severity depending on how much insight is preserved, ranging from obsessions, through overvalued ideas to full-blown delusions [26]. When thoughts about appearance and the resulting judgments are intrusive, but patients remain critical of their content and try to resist them, we are speaking of obsessions. In the majority of anorexia patients, the belief that they are too fat can be classified as an overvalued idea, which is defined as an idea that is at variance with reality, sometimes absurd, which an individual persists in, but does not support with a delusional certainty and is ready to accept that his or her judgment may not be true [17]. On the other hand, in a situation where patients are completely convinced of their overweight despite clear evidence to the contrary, especially when such an attitude represents a threat to their lives, we can speak of delusions, because the patients are unable to assess their judgements rationally [26]. This is consistent with the textbook definition of delusion as a psychotic symptom, a false judgement that is held with strong conviction and does not respond to any persuasion [17].

Another symptom that often accompanies anorexia is dysmorphophobia (body dysmorphic disorder), which may intensify the patient's delusional attitude towards his/her body – according to a study by Grant, it is observed in 39% of anorectic patients [27].

Other authors mention even more obvious psychotic symptoms resembling hallucinations, illusions and regular delusions. Hsu et al. [28] described 6 female patients out of a cohort of 105 individuals suffering from anorexia, of which three developed

psychotic symptoms during treatment of anorexia, and the remaining three – one to four years after resolution of the symptoms of anorexia when they returned to their normal weight.

Patients may perceive food as a threat: they may think it is poisoned, contaminated, still alive or ready to attack; food may be animalized or described as a poison [14]. One's own body is sometimes perceived as being under the influence of external forces, dissolving or being under attack [16]; some patients fear that the contents of their body might spill outside [4] or have a sense of all the body fat going down to their stomach [29]. Delusions of sinfulness may emerge – "I am sinful and I don't deserve to eat" [9]. There are patients who complain about hearing the "voice of anorexia" or a voice that forbids them to eat [12].

The hypothesis that these judgements are psychotic in nature is borne out by the fact the patients' mental status improves after application of the antipsychotic drugs: haloperidol and olanzapine – as confirmed in clinical studies [12, 30–32].

In the course of anorexia nervosa, there may also emerge symptoms of autism similar to those observed in simple-type schizophrenia. Patients with autistic symptoms avoid both verbal and visual contact and seem to be emotionally unresponsive. Their facial expressions, gestures and articulation are monotonous, repetitive and limited in range. They give the impression of being internally desolate [4].

The problem is clinically important in as much as, according to some authors, patients with more severe disturbances of body-image-related thought content have a worse course of the disease. Furthermore, the presence and high severity of delusions is one of the most important factors affecting the course of treatment. Therefore, this aspect of the psychopathology of anorexia nervosa should be considered in developing more effective treatment methods for this disorder [26].

Interventions for comorbid symptoms of anorexia and schizophrenia

Antipsychotics play a major role in the treatment of patients with schizophrenia, which is why it seems logical to use them in cases in which symptoms of anorexia occur in conjunction with psychotic symptoms [2]. Some of these drugs may increase appetite, which, as some researchers believe, could potentially bring benefits to patients with anorexia; it should be noted, however, that treatment with drugs such as olanzapine or clozapine can not only increase appetite but also may have an adverse effect of inducing compulsive overeating [33].

Therefore, it is recommended that patients and their families be educated about the possible side effects of these drugs, especially those related to metabolism; researchers also stress the importance of psychotherapy (e.g., cognitive–behavioral therapy) in patients with comorbid symptoms of schizophrenia and anorexia nervosa [2].

An interesting issue is the potential role of antipsychotics in the treatment of anorexia nervosa even in cases where no clear psychotic symptoms are observed, especially in the light of the fact that the disturbed body image in anorectic patients

is a conviction similar to delusional thinking. In addition, some authors believe that the anxiolytic effect of some antipsychotic drugs can produce a positive effect in this group of patients [34].

A few studies point to the positive influence of second generation antipsychotics on symptoms of depression and anxiety or on body image itself [34]. Contrasting results have been reported in one of the more recent meta-analyses of studies on the subject, published in 2012 by Kishi et al. [35]. Those authors did not demonstrate the effectiveness of this group of drugs in the treatment of patients with anorexia either with regard to body weight or other accompanying symptoms of eating disorders such as anxiety or depressive symptoms. The most recent standards for the treatment of eating disorders, published in 2015, recommend the use of olanzapine in doses of 2.5–7.5 mg/day in chronic, treatment-resistant anorexia nervosa and aripiprazole in patients with particularly severe fear of gaining weight [36].

Conclusions

The present review of the literature on the reciprocal relationships between schizophrenia and anorexia nervosa shows that there are many more connections between these two disorders than is commonly believed. This is confirmed by the diagnostic difficulties experienced by psychiatrists in their everyday clinical practice related to recognizing which of the disorders is primary and which is comorbid. A distorted self-image leading to pathological dieting is consistent with the definition of delusion, which is the most perspicuous link between the two disorders. Taking into account both their temporary coexistence and the etiopathogenesis, the knowledge accumulated so far does not afford unambiguous answers about the nature of the reciprocal relations between anorexia and schizophrenia. More effective diagnosis and therapy in this group of patients requires documentation of further cases of comorbidity of anorexia and schizophrenia and multi-faceted studies that would take into account the psychological, psychopathological, genetic, neurophysiological and other aspects of these two conditions.

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