

Schizophrenia and Eating Disorders: A Challenging Coexistence

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ABSTRACT

Schizophrenia is a severe mental illness that affects approximately 1% of the general population. Although early descriptions of schizophrenia during the nineteenth century included disordered eating as a main symptom of psychosis, the interplay between the two disorders remains understudied. Anorexia Nervosa seems to affect around 1-4% of schizophrenia sufferers, making it a rather rare comorbid disorder. On the contrary, bulimic-type eating disorders, such as Binge Eating Disorder, night eating syndrome, and atypical eating disorders, present a much higher prevalence in patients suffering from psychosis. Binge Eating Disorder has an average prevalence of 5-20% in the schizophrenia population, which is approximately 5 times higher than in the general population. It is noteworthy that the two groups of disorders, although distinct from each other, present some interesting similarities in the patterns of psychopathology, such as obsessive behaviors, body image distortion, rigid beliefs, and ritualistic ways of eating.

Given their frequencies and negative impacts on quality of life, the assessment and management of these disorders needs to be multidisciplinary and well-coordinated. In certain cases, the assistance of medical doctors, psychotherapists, dieticians, and family members is *sine qua non* for the treatment to be effective for both disorders. Because the available literature on the subject is still poor, further studies should be performed in this domain.

INTRODUCTION

Schizophrenia is a severe mental illness that affects around 1% of the general population. It is characterized by a wide range of symptoms, including positive symptoms (delusions and hallucinations), negative symptoms (social withdrawal, blunted affect), and cognitive impairment (difficulties with memory and attention) [1]. Moreover, psychiatric comorbidity is very common among patients with schizophrenia [2]. Anxiety and depressive symptoms are the most common comorbid conditions throughout the course of illness, with an estimated prevalence of 15% for panic disorder, 29% for posttraumatic stress disorder, and 23% for obsessive-compulsive disorder [2]. It is estimated that comorbid depression occurs in 50% of patients, and possibly around 47% of them have a lifetime diagnosis of comorbid substance abuse [2].

Although the early descriptions of schizophrenia during the nineteenth century by Eugen Bleuler included disordered eating as a main symptom of psychosis, the interplay between the two disorders remains understudied [3]. Anorexia Nervosa (AN) seems to affect approximately 1-4% of schizophrenia sufferers, making it a rather rare co-existence, especially when the rarity of both disorders is taken into consideration [3]. On the contrary, bulimic-type eating disorders (EDs), such as Binge Eating Disorder (BED), night eating syndrome, and atypical EDs, present a much higher prevalence in the group of patients suffering from psychosis [3,4]. It has been reported that approximately 10% of the patients exhibit some kind of bulimic behavior [3]. BED and subthreshold binge eating seem to be the most frequent EDs in patients suffering from schizophrenia. BED has an average prevalence of 5-20% in the schizophrenia population, which is approximately 5 times higher than in the general population [3]. It has also been reported that among obese subjects (Body Mass Index (BMI) ≥ 28), 60% of patients suffering from schizophrenia and 30% of controls had also binge-eating symptomatology [5]. This triple comorbidity between psychosis, obesity, and BED has been partially attributed to the use of atypical antipsychotic medication, such as olanzapine and clozapine, since these substances have been associated with an increased likelihood to experience food cravings during drug treatment [6].

It is noteworthy that the two categories of disorders, although distinct from each other, present some interesting similarities in the patterns of psychopathology, such as obsessive behaviors, body image distortion, rigid beliefs, and ritualistic ways of eating [7]. Also, patients suffering from AN have cognitive deficiencies in attention and information processing similar to those found in psychosis [8]. Unfortunately, EDs in the schizophrenia population remain difficult to assess, and schizophrenia patients with EDs usually do not meet all criteria for typical EDs, leading clinicians to consider EDs a secondary problem [3,7].

THE LINK BETWEEN SCHIZOPHRENIA AND EATING DISORDERS

There are four major hypotheses that can explain the link between the EDs and schizophrenia [9].

Hypothesis 1

The first hypothesis is that schizophrenia and EDs coexist independently as two separate mental disorders. In this case, one would expect the following two epidemiological data. The first would be that the frequency of schizophrenia among ED patients would be the same as in the general population. The second would be vice versa; that is, the frequency of EDs among patients suffering from schizophrenia would also be the same as in the general population.

The lack of large epidemiological studies prevents the ability to draw definite conclusions. There are authors who have reported that the incidence of schizophrenia and transient psychotic episodes in patients with EDs is between 3%-10% and 10%-15% respectively [9-10]. These numbers are much higher than expected if the two disorders are completely unrelated from each other. Also, as stated in the introduction of this chapter, the presence of bulimic symptoms in patients suffering from schizophrenia is much more common than the restriction of food intake that characterizes AN.

On the other hand, in Steinhausen's [11] review of the literature on AN, he found that a concurrent diagnosis of schizophrenia was, indeed, rare. More recently, Miotto et al. [12] found no cases of co-morbid schizophrenia among 112 female patients with *DSM-IV* EDs.

Most of the research leads to the conclusion that while the diagnosis of schizophrenia is not common among ED patients, the presence of binge eating and bulimic symptomatology is quite often present in patients suffering from schizophrenia.

Hypothesis 2

The second hypothesis is that EDs are a consequence of schizophrenia and vice versa. This hypothesis suggests that there is a primary condition, and then a secondary condition caused by the former. In the first case, patients suffering from primary schizophrenia might stop eating due to delusions related to food, such as fear of contaminations, thus leading occasionally to the development of full-blown EDs [13]. Also, schizophrenia, and more specifically, negative symptomatology, can lead to BED as a self-healing mechanism for the dysregulated dopaminergic system that is observed in psychosis. Some of the authors that have studied the reward deficiency syndrome have suggested that, similarly to substance abuse and BED, the syndrome can also be observed in schizophrenia [14-17]. "Food addiction," which seems to play an important role in binge-eating behaviors through the dopaminergic modulation of the reward system in the brain [14-16], could also be related to psychotic symptomatology and, more importantly, with negative symptomatology [14,17,18]. In the second case, ED symptomatology that is characterized by

starvation, electrolyte, and metabolic imbalance can induce transient psychotic symptoms. It has been suggested that starvation is especially psychotogenic when it occurs during adolescence, due to the vast changes in the brain and, more specifically, in the regulation of dopamine pathways [19, 20].

Since the secondary condition depends upon the presence of the first, the prediction here would be that effective treatment of the primary condition would automatically ameliorate the symptomatology of the secondary condition [9]. This hypothesis has not been verified by clinical practice, where these disorders usually have to be treated both simultaneously and separately in order to restore the patient's mental health. The most probable explanation is that although the primary condition can act as a trigger mechanism, the secondary disorder has an independent course and needs to be addressed accordingly.

Hypothesis 3

The third hypothesis is that AN is an atypical form of psychosis. This hypothesis is based on three symptoms of AN: firstly, the lack of insight concerning the impact of starvation on the patient's physical and mental condition; secondly, the rigid or even overvalued ideas concerning nutrition, weight, and physical activity; and finally, body image distortion.

It has been reported that around one-third of AN patients express delusional body image beliefs, whereas overvalued ideas appeared to be frequent in both AN and BN [21]. From a genetic perspective, it has been found that dopamine receptor D2 polymorphisms were significantly associated with AN, as well as in genome-wide association studies for schizophrenia [22]. Also, significant associations have been shown between the Val158Met polymorphism of the catechol-O-methyl transferase gene and AN, as well as schizophrenia [22]. Moreover, there is evidence that AN is related with alterations in the same areas of the brain that are implicated in schizophrenia, thus leading to similar neurocognitive dysfunctions, such as difficulties in set shifting and reduced ability to put oneself in the mindset of another person [9]. On the other hand, one recent review and one meta-analysis of randomized controlled studies did not find any evidence that the use of antipsychotics has any positive effect in the treatment of AN [23, 24].

Hypothesis 4

The fourth hypothesis is that ED is a prodromal state of schizophrenia. This hypothesis has been based mainly on the clinical observation that a number of patients exhibit ED symptoms prior to the onset of schizophrenia that diminish when the psychotic symptomatology is manifested [9]. The theory behind this hypothesis is that EDs, and more specifically, AN, are a form of defense mechanism against psychosis [25]. Control of food intake provides a sense of mastery, achievement, and self-control to individuals who may be at risk for psychosis. The increase in feelings of self-efficacy can then help to ward off psychosis [25].

This hypothesis has not yet been corroborated by research evidence with the exception of a recent study by Bratlien et al [26]. The authors investigated self-reported mental/physical symptoms and health service use at the age of 16 in people who later developed a psychotic disorder, and then compared them with a control group from the same geographical areas. They found that the main significant differences between the patient and the control groups was that the former reported more anxiety, depression, and “feeling in need of treatment for eating disorders” at age 16 than the latter. Interestingly, only the rate of self-reported ED symptoms reached the level of statistical significance in the follow-up analysis.

ANTIPSYCHOTIC MEDICATION AND EATING DISORDERS

A fifth hypothesis on the link between schizophrenia and EDs has to do with the use of atypical antipsychotic medication for the treatment of schizophrenia. As stated in the introduction, treatment with atypical antipsychotics can cause food cravings and has been shown to be associated with increased appetite and obesity [6,27]. A study that evaluated the eating behaviors of 153 patients with schizophrenia observed that patients treated with atypical antipsychotics were more responsive to external food cues and had higher scores on the item “loss of control eating behavior” than both patients taking first-generation antipsychotics and control subjects [28]. Furthermore, BED seems to be quite frequent in populations of obese patients suffering from schizophrenia [3,5,29]. There has yet to be an explanation of this relationship, as it not quite certain if the antipsychotic medication that has been “incriminated” for weight gain can also cause binge-eating symptomatology.

Following the findings from the use of atypical antipsychotics in schizophrenia, olanzapine has been investigated vigorously in the last decade as a treatment for AN. The results so far remain controversial. The most positive results show that AN patients under treatment with olanzapine have more favorable outcomes where weight gain is concerned [30]. On the other hand, a recent meta-analysis of the randomized controlled studies did not find that the add-on of olanzapine had any significant benefit in the treatment of AN [24].

EATING DISORDERS AND SCHIZOPHRENIA IN MALE PATIENTS.

Although EDs are more common in female adolescents, adult male patients should not be ignored, as they present a small, but substantial group of patients with rather “atypical” symptomatology. A recent review on the literature on EDs and schizophrenia in male patients has provided a better insight in this issue [31]. The authors found that in the population of patients suffering from schizophrenia, AN co-existed in approximately 0.81% of them. When the opposite relation was studied, the authors found that a male patient suffering from an ED has 3.6 times more risk than a woman for suffering also from schizophrenia. The authors concluded that the interplay between the two disorders can be described in four distinct categories: “a) acute psychotic episode related to organic causes due to malnutrition; b) male patients presenting with

an ED who later develop schizophrenia; c) male patients known to suffer from schizophrenia and who develop distorted eating cognitions and disordered behaviors; d) male patients suffering from schizophrenia and developing a medication-induced ED" [31].

CHALLENGES IN THE TREATMENT OF SCHIZOPHRENIA AND EATING DISORDERS

Helen is a 44-year-old patient who has been suffering from schizophrenia since the age of 24. She is currently under treatment with clozapine 400mg/day. The last relapse of the psychotic disorder was at the age of 32. During the past 6-7 years, Helen has been willingly restricting food intake. Her weight has gradually decreased to a BMI of 15.4. She explains this change by saying that she does not need more food or that she would like to avoid becoming fat. She is working in a small family business with her parents and her brother. Both she and her family agree that she is very responsible and efficient in her job, but also quite anxious and has low self-esteem. Helen cannot reflect on the reasons that led her to avoid food. Instead, she constantly replies in a low tone that she does not think that her body needs the extra calories. When confronted about her latest episode of fainting, she replies by agreeing that it was caused by her low blood pressure, but her opinion is that this is not related to low energy intake. Finally, although she complies to psychotherapy sessions, she explicitly states that she prefers to discuss more important issues than eating, but does not elaborate further on these issues.

The story of Helen is a rather common case vignette of the comorbidity between schizophrenia and ED. Treating patients like Helen presents a number of challenging adversities that need to be addressed in order to facilitate the patient' s recovery:

The Lack of Insight

Both disorders are characterized by low insight, especially in the case of restrictive type AN and schizophrenia. Patients are often reluctant to visit their therapists, adhere to the prescribed medication, or try to increase their daily caloric intake. Like Helen, they often have a genuine disbelief about the necessity for psychological and pharmaceutical treatment.

Negative Symptomatology

Negative symptomatology dramatically decreases the effectiveness of psychotherapy for EDs, as it reduces the ability of the patient to form a solid collaborative therapeutic relation, to do his/her weekly homework, and in general, to make a sufficient effort to keep up with the therapeutic requirements. Over two years of psychotherapy, Helen has kept her weekly nutrition diary only once or twice. She also requires quite a long time to comprehend the reinforcing nature of AN and to decide to do things in a different way. Also, due to her attention deficits caused by the chronic psychosis, each session usually lasts 30 minutes instead of the usual 45-50 minutes, thus leaving less time to explore and discuss her situation.

Positive Symptomatology

Delusional thoughts and hallucinations decrease the ability of patients to be in psychotherapy. This is especially true in the case of psychotic symptoms that refer to food intake and the body. Fears of food poisoning, delusional thinking about body shape, and hallucinations that command the person to stop eating are commonly reported symptoms in patients suffering from both disorders. At a certain point of her treatment, Helen decided to attend to her chronic dental problems. After a few visits to her dentist, she developed an intense fear that her oral condition would deteriorate indefinitely, thus leading to some kind of undefined catastrophic consequence for her health. Due to the above, she reduced eating to a minimum, losing even more weight.

Antipsychotic Side Effects

The side effects of antipsychotics, such as increase of appetite and weight gain, can reduce the ED patient's adherence to pharmacotherapy for the psychotic symptomatology. When Helen suffered from a brief relapse of the psychosis and her treating psychiatrist suggested an increase in the dose of clozapine, she declined his suggestion based on the fact that clozapine can increase body weight. It took a long discussion to present the fact that weight gain does not seem to be dose-related in order for her to concur with the medication adjustment.

Starvation

The impact of starvation in both psychotic symptomatology and as a response to antipsychotic medication has not been adequately studied. During the period that she increased caloric intake, Helen became less socially and emotionally withdrawn, her attention strengthened, and her outdoor activities increased in quantity and diversity.

Socio-Economic Environment

The impact of a bad socioeconomic environment, which frequently affects the population of patients suffering from schizophrenia, is directly responsible for their limited access to medical care and healthy food. This represents a major obstacle to the implementation of lifestyle and dietary rules necessary for the treatment of ED, and especially BED, instead contributing to an unbalanced diet and insufficient physical exercise. Helen's parents, who were into their early 70s, often expressed their concern about their daughter's social and financial future, as they struggled to keep their family business for as long as possible in order to provide her with a stable environment until she would be able to ward off the anorectic symptomatology and become more self-reliant.

TREATMENT RECOMMENDATIONS

Although treatment of concurrent schizophrenia and ED, especially AN, seems like an impossible task, there is a place both for medication and psychological treatment. As one might expect, the co-existence of both disorders dictates changes in the treatment plan. Pharmacological

treatment needs to be as neutral as possible in regards to appetite and weight gain, thus limiting the choice of atypical antipsychotics. Furthermore, psychological treatment needs to take into consideration the cognitive and attention deficits caused by psychosis and adjust the duration of each session and the type of weekly homework accordingly. Progress in most of the cases is slower than expected thus leading the patients and their families to feelings of disappointment and frustration. Kouidrat et al. [3], based on their extensive review of the literature on ED and schizophrenia, proposed the following recommendations for the clinical practitioner:

- Assess eating behaviors and screen for EDs, using validated tools if necessary. Recognize the somatic risks associated with EDs, and assess the patient's nutritional status (e.g., malnutrition, weight gain, and cardiometabolic disorders).
- Interview the patient about his or her quality and duration of sleep.
- Educate patients and family members on the side effects of antipsychotics (e.g., change in appetite, weight gain, risk of glucose intolerance, and lipid abnormalities).
- If possible, adjust the patient's antipsychotic treatment in accordance with his or her metabolic profile.
- Organize multidisciplinary and early management of EDs
- Develop a personalized and comprehensive treatment strategy, including lifestyle measures (e.g., diet, adapted physical activity, and sleep hygiene).
- Use cognitive behavioral therapies that have proven effective in the field of EDs.

CONCLUSIONS

In conclusion, we should keep in mind that the co-existence of schizophrenia and ED, especially BED, is not so rare as previously thought. Given their frequency and negative impact on quality of life, the assessment and management of these disorders needs to be multidisciplinary and well-coordinated. In certain cases, the assistance of medical doctors, psychotherapists, dieticians, and family members is *sine qua non* for the treatment to be effective for both disorders. Because the available literature on the subject is still poor, further studies should be performed in this domain.

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