INTERNATIONAL JOURNAL OF
CLINICAL NEUROSCIENCES
AND MENTAL HEALTH

REVIEW

Relevance of obsessive-compulsive psychopathology in anorexia nervosa: a brief narrative review

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Abstract

It has been suggested that anorexia nervosa (AN) may be related to obsessive-compulsive disorder (OCD). There is also the idea that certain obsessive personality traits are frequent in patients with AN. In this paper we aimed to organize the literature concerning the nature of the relationship between AN and obsessive pathology, both as OCD and as obsessive personality traits and to suggest new research topics in the future, as well as pointing the main methodological difficulties in previous studies.

According to the analyzed data obsessive-compulsive psychopathology in AN occurs in several forms. One of those is related to the obsessive personality traits, which may be found before the onset of the eating disorder (ED) and are also found after recovering a healthy weight. However, obsessive-compulsive (OC) symptoms also increase during periods of worsening of the ED.

There are different approaches concerning the study of the relationship between OC psychopathology and AN, including based on neurobiological factors, on the study of psychiatric symptoms and personality factors. In future studies, it would be important to have a better differentiation between obsessive personality traits and obsessive-compulsive symptoms, a clearer individualization of ED syndromes in patient samples and continue the neurobiological study of these conditions, further characterizing their putative link.

Keywords: Anorexia nervosa, Obsessive, Compulsive, Obsessive-compulsive disorder, Eating disorders.

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Citation: Coutinho et al. Relevance of obsessive-compulsive psychopathology in Anorexia Nervosa: a brief narrative review. International Journal of Clinical Neurosciences and Mental Health 2019; 6:1

DOI: https://doi.org/10.21035/ijcnmh.2019.6.1

Received: 28 Apr 2018; Accepted: 20 Dec 2018; Published: 29 Jan 2019

Introduction

Anorexia nervosa (AN) is an eating disorder (ED) characterized by marked fear of weight gain, which can lead to states of extreme malnutrition. It has often a prolonged course and important medical and psychiatric comorbidities [1]. Lifetime prevalence is estimated to be from 1.2 to 2.2% in the female gender, being about ten times less frequent in males [2].

Since many decades ago it is suggested that AN may somehow be related to obsessive-compulsive disorder (OCD). There is also a classical idea about personality traits like rigidity, perfectionism and meticulousness being frequent in patients with AN [3].

It is estimated that 20 to 40% of AN patients present OCD and 20 to 30% present obsessive-compulsive personality disorder (OCPD). [4] In this paper we will analyze the nature of the relationship between AN and obsessive psychopathology, both as OCD and as obsessive personality traits, by means of a brief narrative review of articles specifically concerning the relationship between these entities.

We conducted a review of articles indexed in Medline, via Pubmed, using the search terms "anorexia nervosa", "eating disorders", "obsessive", "compulsive", and "obsessive-compulsive disorder", selecting articles written in English published up to February 28th, 2018, resulting in a pool of 712 articles. After analysis of title and abstract, articles specifically addressing comorbidity between AN and OCD or OC personality traits or about explanations linking these conditions were selected, resulting in the final selection of 23 relevant articles which were included in this paper.

Relationship between anorexia nervosa and obsessive-compulsive disorder

As stated before, OCD is considered a frequent comorbidity of AN. According to a cross-sectional study with 101 female adolescents with AN, 16.8% had a diagnosis of OCD as comorbidity [5] and according to a retrospective study with 56 AN patients, 37.5% had the diagnosis of OCD during their lifetime [6]. In **Table 1**, we present a summary of studies under assessment, including date of the publication, analyzed sample, key findings and strengths of the studies as well as their main limitations.

Regarding obsessive-compulsive symptoms, in a study with 324 patients with AN, 68% of those with AN restrictive subtype and 79.1% of those with AN binge-eating/purging subtype had lifetime history of OC symptoms. There were no differences to the control group of OCD patients in the frequency of somatic and symmetry obsessions. The OCD group had higher frequency that the AN group in other dimensions of OCD symptoms, namely aggressive, contamination or sexual obsessions and checking, repeating and counting compulsions [7].

In other study with 18 patients with AN and 16 patients with OCD, there was similar frequency of obsessive-compulsive symptoms in both diseases, with similar scores in the Yale Brown Obsessive-Compulsive Scale (Y-BOCS) scale. However, OCD patients endorsed in a wider range of obsessions and compulsions, whereas AN patients had more frequently symptoms related with symmetry and order [3].

Regarding the impact of OC symptoms in AN, in a group of 30 patients with AN and 30 patients with bulimia nervosa (BN), the presence of OC symptoms was associated with the severity of the ED [8], and in other study with 24 patients with AN evaluated at different time, it was observed a tendency to the reduction of the Y-BOCS score as the patient's weight recovered [9].

In a case-control study with 254 patients with ED and OCD and a control group composed of 254 with ED without OCD, an improvement in obsessive symptoms was responsible for a significant variance in the improvement of ED symptoms. From other perspective, the improvement in ED symptoms mediated completely the improvement of obsessive symptoms. These results indicate that ED and OC symptoms may have a reciprocal relationship, influencing each other [10].

Considering the overlap of symptoms seen in patients with AN and comorbid OCD, it is also suggested that individualized forms of treatment tailored to answer both clusters of symptoms could improve the prognosis of these patients and possibly shorten the duration of treatment [11].

In a study of 56 inpatients with comorbid ED and OCD, the authors utilized an exposure and response prevention programme tailored both to obsessive and eating symptoms, attaining reductions both in ED and OC symptoms [12].

Obsessive personality and anorexia nervosa

There is a vast amount of scientific literature describing rigidity, perfectionism, inflexible cognitive style and meticulousness as traits that are frequently found in personalities of patients with AN. We should also note that many of these characteristics are central in the OCPD, defined by the preoccupation with order and perfection and the need of mental and interpersonal control at the expense of the openness to experience [11].

Especially in AN restrictive subtype patients, these characteristics of obsessive personality are frequently present, as seen in the need to center on details, rigid alimentary rules and calorie counting. The need for perfection is also present, in the constant search for the supposedly perfect body weight and shape [13].

These personality traits are important to the outcome of AN. A systematic review points in this direction, considering that the presence of obsessive compulsive personality traits leads to a worse prognosis in AN and moderates the outcome of this disorder [14].

Within these obsessive personality traits one of the most described in the literature is perfectionism. In a study with 39 patients with ED, there were higher levels of concern over mistakes and pure personal standards [15].

Table 1. Summary of assessed studies.

Authors	Sample	Key Findings/Study strengths	Main limitations
Halmi et al, 2003	324 patients with AN	68% of the patients of the AN-restrictive subtype and 79.1% of the AN- binge-eating/purging subtype had a history of obsessions or compulsions; Represents the largest, at the date, assessment of obsessions and compulsions in AN patients	Possible nonrepresentativeness of the analyzed sample
Bastiani et al, 1996	18 patients with AN and 16 patients with OCD	On the evaluation with the Y-BOCS scale, OCD subjects had a wider range of obsessions and compulsions, while AN patients had mostly symptoms related to symmetry and order; Scores between AN and OCD symptoms suggests phenomenological differences between these disorders	Small sample size
Jimenez-Murcia et al, 2007	30 patients with AN, 30 patients with BN and 30 patients with OCD	In the ED group, the presence of OC symptomatology was positively associated with the severity of the ED, as evaluated with the MOCI and EDI; Explores differences in OC symptomatology between AN, BN and OCD, establishing a positive association between severity of the ED and presence of OC symptoms	Small sample, cross sectional design, does not differentiate whether obsessive or eating disorder symptoms appear earlier
Mattar et al, 2012	24 patients with AN	Obsessive symptomatology evaluated at the beginning and end of hospitalization for weight restoration, with a tendency towards reduction of Y-BOCS; Explores the relationship between weight loss and comorbid psychiatric symptoms	Small size of the sample, there was not a total weight restoration in the subjects
Olatunji et al, 2010	254 patients with a diagnosis of ED and 254 patients with an ED and OCD	Obsessive-compulsive and eating symptomatology evaluated at beginning and end of inpatient treatment. Multilevel mediation analyses revealed that improvements in OCD symptoms over time accounted for significant variance in the improvements in eating-disorder symptoms and decreases in eating-disorder symptoms over time fully mediated improvements in OCD symptoms; Large sample size, exploring the reciprocal relationship between variations in OC and ED symptomatology	
Simpson et al, 2013	56 patients diagnosed with an ED and OCD	Treatment at a residential setting, with a psychotherapeutic approach based on Exposure and Response Prevention aimed at OC and eating symptoms. Evalutation of Y-BOCS and EDE-Q at the beginning and end of the programme. There were observed reductions in OC and eating symptoms severity	Multimodal treatment plan, making it difficult to determine what components caused the improvement of symptoms
Crane et al, 2007	Systematic review, including 11 prospective longitudinal studies and 12 randomized controlled trials	Data supporting that OCPD traits lead to a worse prognosis in patients with AN	Data about intervention, outcome, and assessment of OCPD traits differ substantially across studies
Sassaroli et al, 2008	39 patients with ED (15 with AN and 24 with BN), 37 patients with OCD, 25 patients with MDD and 44 individuals without any of these disorders	Patients with ED had higher levels of Concern Over Mistakes than patients with MDD or OCD patients and had higher level of Personal Standards and Pure Personal Standards than controls	Relatively small number of participants and limited number of clinical groups examined
Machado et al, 2014	86 patients with AN, 86 healthy controls and 68 patients with other psychiatric diagnoses	Perfectionism was one of the factors that emerged as a risk factor in the development of AN	Retrospective design with the possibility of recall bias
Degortes et al, 2014	116 patients with AN, 32 healthy sisters of those patients and 119 controls	Assessment of traits such as perfectionism, inflexibility, rule-bound traits, drive for order and symmetry, and excessive doubt and cautiousness, with retrospective self-reports and maternal reports; AN patients had more OC traits than their healthy sisters and controls.	Retrospective study design, susceptible to recall bias, limited by the addition of maternal reports.
Srinivasagam et al, 1995	20 patients who had recovered from AN and 16 healthy controls	Recovered AN patients had significantly higher scores of perfectionism	Small size of the sample
Holtkamp et al, 2005	17 patients who had recovered from AN for at least 3 years and 39 healthy controls	Recovered AN patients had higher levels of OC traits	Small size of the sample

Table 1. Summary of assessed studies.

Authors	Sample	Key Findings/Study strengths	Main limitations
Mas et al, 2013	116 patients with AN, 74 patients with OCD and 91 controls	Genetic analysis of 213 SNPs in 28 candidate genes were analyzed. Results suggest a partial genetic background between AN and OCD	Small sample size, absence of stratification into subgroups based on comorbidities
Cederlof et al, 2015	Individuals with a diagnosis of OCD (N-19,814) or AN (N-8,462) in the Swedish National Patient Register between January 1992 and December 2009; their first-, second- and -third-degree relatives; and population-matched unaffected comparison individuals and their relatives	Individuals first diagnosed with AN had an even greater risk for a later diagnosis of OCD	Underrepresentation of the diagnosis because many patients may not need hospitalization and so do not enter the registry
Strober et al, 2007	574 first-degree relatives of 152 probands with AN compared to 647 first-degree relatives of 181 never-ill control probands.	First-degree relatives of patients with AN-had higher lifetime prevalence of OCD, OCPD, and anxiety disorders	Future anxiety and OCD may yet occur in the control group probands; Only AN-restrictive subtype patients were analyzed in the study

AN: Anorexia Nervosa; BN: Bulimia Nervosa; ED: Eating disorder; EDE-Q: Eating Disorder Examination Questionnaire; EDI: Eating Disorder Inventory; MDD: Major depressive disorder; MOCI: Maudsley Obsessive Compulsive Inventory; OCD: Obsessive-compulsive disorder; OCPD: Obsessive-compulsive personality disorder; SNP: single nucleotide polymorphisms; Y-BOCS – Yale-Brown Obsessive-Compulsive Scale.

In a case control study with 86 patients with AN, 86 healthy controls and 68 patients with other psychiatric diagnosis, it was observed that perfectionism was associated to a high risk of developing AN [16].

In another study with 116 patients with AN, 32 healthy sisters of those patients and 119 healthy controls, the authors reached the conclusion that AN patients had more obsessive personality traits in childhood comparing to other groups. The authors also found a relationship between the number of obsessive traits in childhood and actual psychopathology, including body image distortion [17].

Considering patients which have already recovered an healthy body weight, there can still be observed characteristics like the need for order and precision, as demonstrated in a study with 20 patients with AN, already recovered from their ED and 16 healthy controls, where patients with previous AN related higher perfectionism levels on Eating Disorder Inventory (EDI), greater Y-BOCS score and greater overall perfectionism in a Frost Multidimensional Perfectionism Scale [18]. In other study with 17 patients with AN, when evaluated 3 years after recovery of the eating psychopathology, high levels in OC symptoms scales were observed in comparison with healthy controls [19].

Neurobiological data

In line with the data presented so far, supporting some association between AN and OCD, a genetic analysis of single nucleotide polymorphisms in 28 candidate genes in a population of 110 patients with AN, 74 patients with OCD and 91 healthy controls, preliminary data pointed towards a partial genetic background between the two disorders, particularly in genes related to serotoninergic and glutamate pathways and in genes related to neurogenesis [20].

In other study, made with data from a national patient registry, 8462 patients with AN and 19814 patients with OCD were included, and it was concluded that individuals with AN had relative risk of 9.6 of developing OCD. In this same registry, analysis in twin models showed a moderate but significant genetic overlap between AN and OCD. However, the authors also state that there must be specific genetic factors of each disorder and environmental risk factors that contribute to their etiology [21].

In other study, 152 patients with AN and 574 first degree family members of those patients were compared to a group of healthy controls and their respective relatives. The authors evaluated lifelong presence of anxiety disorders and OCD, and it was observed that these were more frequent in family members of patients with AN, including OCD and OCPD [22].

From a biochemical point of view, it is suggested that in OCD there is an increase in serotoninergic function related to avoidant behaviors and a diminished function related to disinhibited like behaviors, such as recurrent violent thoughts. In a parallel way, also in ED, there may be an increase of indicators of serotoninergic function related with food eviction, such as in AN restrictive subtype and diminishing of that function in cases of disinhibited and impulsive eating behaviors, such as in BN. According to this model, both disorders could be placed on a continuum where in one extreme the disorders are characterized by avoidant symptoms and in other extreme by insufficient inhibition [23]. Also in functional neuroimaging with magnetic resonance there were similar findings in patients with AN and OCD during provocation with ordering and symmetry symptoms [4].

Conclusions

According to the analyzed data, we can look at obsessive-compulsive psychopathology in AN from several perspectives. One is related to the frequent obsessive person-

ality traits, which are found before the onset of the ED and are also found after recovering and maintaining a healthy weight. However, it is also of note that OC symptoms increase during periods of worsening ED, associated with phases of greater malnutrition.

From a neurobiological point of view, the available evidence seems to suggest there is a partial genetic background between AN and OCD, considering however that there are probably other variables, namely environmental risk factors and disorder specific gene risk explaining the differences between these disorders.

In terms of future research, it would be important to have a better definition between obsessive personality traits and obsessive-compulsive symptoms, individualization of ED syndromes in patient samples and continue the neurobiological study of these conditions, in order to characterize their putative link. Also, many of the analyzed studies used small size samples, leading to the need of replicating these results in studies with larger samples. To better clarify the relationship between obsessive personality traits and AN, studies with longer follow-up after nutritional recovery will be needed. Retrospective analysis with larger samples and recourse to information provided by family members could help clarify the data about pre-morbid personality traits in these patients.

Abbreviations

AN: Anorexia nervosa; BN: Bulimia nervosa; ED: Eating disorder; EDI: Eating Disorder Inventory; OCD: Obsessive-compulsive disorder; OCPD: Obsessive-compulsive personality disorder; Y-BOCS: Yale Brown Obsessive-Compulsive Scale

Competing interests

The authors declare that there are no conflicts of interests.

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