Association Between Paranoia And Anorexia Nervosa In Adolescents: What Factors Are Involved?

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Research article

Keywords: Anorexia, Paranoia, Psychosis, Adolescents, Youth

Posted Date: February 26th, 2020

DOI: https://doi.org/10.21203/rs.2.24625/v1

Abstract

Background: psychiatric comorbidities are of particular interest in Eating disorders. The association between anorexia nervosa and psychotic disorders is less studied than that with affective disorders (anxiety/depression). The aim of this study is to describe a psychotic symptom (paranoia) in adolescents with Eating Disorders looking at several potential explicative associated factors: eating disorder symptoms, body image concerns, depression and social anxiety. Our hypothesis is that paranoia in AN patients is more explained by the concomitant depression and social anxiety symptoms than core symptoms of the disease (eating disorder symptoms or body image concerns).

Methods: this is a retrospective cross sectional study and consecutive, help-seeking adolescents admitted to the Eating Disorder service of the Integrated Pediatric Care Department, Luigi Vanvitelli University Hospital constituted the sample. Data was obtained trough retrospective collection of clinical interviews and self – report questionnaires administered by trained and expert child and adolescent psychiatrists.

Results: We obtained data from 92 adolescents with Eating Disorders. Paranoia was dimensionally distributed in the sample (mean: 22,17 SD: 17,7; median 18 IQR: 7/36; range: 0-62). Our regression model explained that paranoia in this population was better explained by depression (coefficient= 0,415 SD: 0,210, p=0,052) and social anxiety symptoms (coefficient= 0,253 SD: 0,060; p<0,001) than eating disorder symptoms (coefficient= 0,092 SD: 0,107; p=0,398) and body image concerns (coefficient= 1,916 SD: 2,079; p=0,359) that did not retain their significance when all our predictive factors entered in the model.

Conclusion: This study has some theoretical, clinical and treatment implications. It is important to carrying out screening for the presence of psychotic symptoms in patients with Eating Disorders. These symptoms and associated factors (depression and social anxiety) may complicate the clinical picture of the disease with the need, in certain cases, of psychopharmacological drugs and, among these, anti-psychotics. Finally in the psychotherapy context, paranoid idea may be subject of treatment for patient with EDs.

Introduction

Eating Disorders (EDs) involve millions of people and lead to high individual family and social costs. In fact EDs are associated with somatic complications, psychiatric comorbidities and many psychological and neurocognitive traits (1). Lifetime prevalence of EDs (anorexia Nervosa – AN; Bulimia Nervosa – BN; Binge Eating Disorder – BED) is 4.4% and about 1 to 3 times higher in female in AN and BN. The onset occurs mainly between 18 and 21 years (2). AN is characterized by weight loss, difficulties in maintaining an appropriate body weight for height, age, and stature; and, in many individuals, distorted body image (3). AN has the highest incidence in the middle and final phase of adolescence. There are several associated risk factors and they are genetics and puberty and body changes in adolescence. In this developmental phase there is a specific vulnerability to the ideals of thinness with social pressures to be thin and consequently body image dissatisfaction that lead in turn to restrictive diet, depression and low

self-esteem (4). Psychiatric comorbidities are of particular interest because they have an impact on the diagnosis, treatment and course of the disorder. In a study by Hudson et al, an high percentage of participants had positivity for at least one diagnostic criterion of DSM IV core disorders. In detail anxiety and mood disorders are those more investigated (2). It is evident that the comorbidity with affective or classically “neurotic disorders” has been much more studied than the possible comorbidity with psychotic disorders (5). The contributions on this topic have taken different directions. First of all, the association between EDs, AN and schizophrenia and/or psychotic symptoms; secondly, the use of antipsychotics in the multilevel treatment of AN. For the last aspect there are scattered naturalistic and open label contributions and more recently randomized controlled trial on the use of this specific pharmaceutical class for several AN symptoms or disease condition (6–10). On the other hand, looking at the AN psychosis association, the contributions appear to be poorly systematized and mainly related to case reports or adult studies (5, 11–15). The result is that this association remains understudied and poorly understood with some critical and methodological problems (cross-sectional studies, small samples, outpatient/inpatient, and self-administered questionnaires versus semi-structured interviews) (16). A non-marginal problem is represented by the temporal direction of the association and if EDs precede the onset of psychotic symptoms or the contrary. McGrath et al. tested the bidirectional association between DSM IV (diagnostic and statistical manual of mental disorder – fourth edition) mental disorders, including EDs and psychosis in a large survey across 18 countries including 31,261 respondents. Authors found that the association between EDs and psychotic experiences was not bidirectional with only the temporally relationship between AN and the subsequent onset of psychotic experiences (O.R 2.8, 95% CI = 1.0–7.8) and not vice versa (17).

In the last years the study of psychosis has taken a new direction in order to overcome the classic distinction between neurosis and psychosis (18) and to evaluate also psychotic symptoms in the general population also called psychotic like experiences (PLEs) in addition to clinical conditions (19). Freeman et al. pointed out that emotional disorders frequently develop prior to and accompany psychosis and that they may influence the content of delusions and hallucinations (18, 20). PLEs are common among adolescents (21) and among these paranoia is one of the most frequent in terms of occurrence (22, 23). Garety et al. described a psychological model in which the interplay between biological, psychological and social factors contribute to the development of positive psychotic symptoms (24) and more in detail paranoia may build upon emotional concerns such as social anxiety and interpersonal worry themes (25).

Therefore the aim of this study is to describe paranoia in an adolescent EDs population looking at several potential associated factors: eating disorder symptoms, body image concerns, depression and social anxiety. Our hypothesis in line with cognitive model of positive symptoms of psychosis is that paranoia in AN patients is more explained by the concomitant depression and social anxiety symptoms than core features of EDs (eating disorder symptoms or body image concerns). We assumed that EDs preceded paranoia in line with the literature (17). Therefore in the analyses eating disorder symptoms, body image concerns, depression and social anxiety were treated such as explicative factors (Independent variables IVs) whereas paranoia was the outcome (Dependent Variable DV).

Material And Methods

Sample and Design

The sample was constituted by consecutive help-seeking adolescents admitted to the eating disorder service of the Integrated Pediatric Care Department, Luigi Vanvitelli University Hospital. We obtained data trough retrospective collection of clinical interviews administered by trained and expert child and adolescent psychiatrists and self – report questionnaires. These tools were part of the routine assessment for these patients. Inclusion criteria were Diagnostic And Statistical Manual Of Mental Disorder 5th edition (DSM – 5) based clinical diagnosis of AN or Eating disorder not otherwise specified (EDs NOS). Exclusion criteria were intellectual disability and other neurodevelopmental disorders. The study was performed in accordance with the 1964 Helsinki declaration and its later amendments. Patients or their legal representatives gave consent to the clinical routine assessment.

Measures

Eating problems
we used the Eating Attitude Test – 26 (EAT-26) for symptoms and concerns about eating disorders. The EAT – 26 included 26 items with Likert scale response options (never, rarely, occasionally, frequently, always). A score at or above 20 represents a cut-off for problems about dieting, body weight or concerns on eating behaviors (26).
Body image
for the body image problems we used the Body Uneasiness Test - A (BUT – A) that is a 34-item self-report questionnaire with questions about weight phobia, body image concerns, avoidance, compulsive self-monitoring, detachment and estrangement feelings towards one's own body (depersonalization) (27).
Depression
for detection of depressive symptoms we used the Children Depression Inventory (CDI) that was constituted by 27 self-report items. The score range from 0 to 54 because the items offer three possible scores (0, 1, or 2). A score of 19 is considered a cut-off for depressive symptoms (28).
Social – Anxiety
the Liebowitz social anxiety scale – children and adolescents (LSAS-CA) is 24 items interview: 12 items refer to social interaction situations; the other 12 refer to performance situations. Each item assesses the fear level and the avoidance level on a Likert type scale: Clinician ratings of anxiety (0 = none, 1 = mild, 2 = moderate, 3 = severe) and avoidance (0 = never, 1 = occasionally, 2 = often, 3 = usually). It provides seven scores: anxiety related to social interaction; performance anxiety; total anxiety; avoidance of social interaction; avoidance of performance situations; total avoidance; a total score (29).

Paranoia
we used the paranoia subscale of the Specific Psychotic Experiences Questionnaire (SPEQ). It was constituted by 15 items with a 6-point Likert scale (0 = Not at all, 1 = Rarely, 2 = Once a month, 3 = Once a week, 4 = Several times a week, 5 = Daily) (22). We already used this scale for other study (23).
Other variables

we collected demographical and personal data from patient's clinical records. The Wechsler Intelligence Scale for Children fourth edition (WISC - IV) was used for the intelligence quotient (IQ).

Statistical analysis

We used the Statistical Package for the social sciences SPSS (version 20.0). First of all a set of descriptive analyses (frequencies, percentage, means and standard deviations, medians and interquartile ranges) have been carried out to describe the sample. A Pearson correlation analysis was performed between paranoia and eating disorder symptoms, body image concerns, depression and social anxiety. Subsequently in order to be more explicative about our explicative factors and their interaction in the relationship with paranoia, a hierarchical linear regression has been performed between paranoia (our DV) and our IVs (eating disorder symptoms, body image concerns, depression and social anxiety). In the first step we entered confounders (sex: 0 = male, 1 = female; diagnosis: 0 = ED NOS, 1 = anorexia nervosa and BMI), then we entered eating disorder symptoms, next body image concerns, then we entered depression and finally social anxiety.

Results

The sample included 92 patients and female were 79 (85,9%). Mean age was 172,4 months (S.D. 22,3, range 132–214). Mean body mass index (BMI) was 16,3 (S.D. 2,3, range 11–23,6). Regarding BMI, 53 (57,6%) subjects were under the 5° percentile (pc), 19 (20,7%) between the 10° and the 25° pc, 14 (15,2%) between the 25° and 50° pc, 4 (4,3%) between the 50° and the 75° pc and 2 (2,2%) between the 75° and the 100° pc. Weaning problems were manifested in 13 subjects (14,1%). 66 subjects (71,7%) have received a diagnosis of Anorexia Nervosa (AN) and 26 (28,3%) had a diagnosis of Eating disorder not otherwise specified (ED-NOS). 79 (85,9%) and 13 (14,1%) participants had respectively a restrictive and binge/purging subtype. Table 1 showed descriptive statistics of paranoia, eating disorder symptoms, depression and social anxiety; 20 (21,7%) subjects had score on paranoia scale ≥ 38 (75°pc). Table 2 presented the correlation between paranoia score and eating disorder symptoms (0,598 $p < 0,001$), body image concerns (0,685 $p < 0,001$), depression (0,707 $p < 0,001$) and social anxiety (0,730 $p < 0,001$). Table 3 indicated results of the hierarchical linear multiple regression analysis between paranoia (DV) and eating disorder symptoms, body image, depression and social anxiety (IVs). In the first step we demonstrated that confounders did not have effect on paranoia. In the second step eating disorder symptoms predicted paranoia with positive and significant coefficient (0,549 SD: 0,084; $p < 0,001$); in the third step body image concerns predicted paranoia with positive and significant coefficient (8,641 SD: 1,868; $p < 0,001$) and eating disorder symptoms were no more significant (0,097 SD: 0,123; $p = 0,433$). In the fourth step, depression predicted paranoia with positive and significant coefficient (0,723 SD: 0,216; $p < 0,001$;) with slight change in significance for body image concerns (4,268 SD: 2,196; $p = 0,055$). In the fifth step, social anxiety predicted paranoia with positive and significant coefficient (0,253 SD: 0,060; $p < 0,001$) with the depression coefficient that remains substantially significant (0,415 SD: 0,210, $p = 0,052$) and body image concerns coefficient, which does not maintain its significance (1,916 SD: 2,079; 0,359). The effects of our all IVs (and confounders) accounted for about 60% (adjusted $R^2 = 0,599$) of the model with change in R^2_{diff} in the consecutive steps exposed in Table 3.

Table 1
descriptive of symptoms

	Mean (SD)	Median (interquartile range-25/75)	Range
Paranoia	22 (17,7)	18 (7/36)	0–62
EAT-26	27,3 (19,5)	22 (10/22)	0–73
BUT	1,87 (1,28)	1,75 (0,72/2,84)	0–4,5
CDI	16,4 (10,3)	15,5 (8/24)	0–51
LSAS total score	37,7 (29,7)	30,5 (13,2/61)	0-132
EAT-26 = Eating Attitude Test – 26			
BUT = Body Uneasiness Test			
CDI = Children Depression Inventory			
LSAS total score = Liebowitz social anxiety scale – children and adolescents			

Table 2
Pearson correlation analysis between paranoia, eating disorder symptoms, body image concerns, depression and social anxiety.

	EAT26	BUT	CDI	LSAS total score
Paranoia	0,598 ($p < 0,001$)	0,685 ($p < 0,001$)	0,707 ($p < 0,001$)	0,730 ($p < 0,001$)
EAT-26 = Eating Attitude Test – 26				
BUT = Body Uneasiness Test				
CDI = Children Depression Inventory				
LSAS total score = Liebowitz social anxiety scale – children and adolescents				

Table 3
hierarchical linear regression analysis between paranoia DV and eating disorder symptoms, body image concerns, depression and social anxiety IVs (confouders: sex, BMI, diagnosis).

Paranoia	B (SD)	Beta	T	Sig (p)	R^2_{diff} (sig)
Step 1 Sex BMI Diagnosis	5,522 (5,3) 0,623 (0,8) 7,950 (4,6)	0,109 0,082 0,200	1,039 0,699 1,717	0,302 0,487 0,090	0,043 (p = 0,274)
Step 1 Previous plus EAT 26	0,549 (0,084)	0,603	6,563	< 0,001	0,319 (p < 0,001)
Step 3 previous plus EAT26 BUT	0,097 (0,123) 8,641 (1,868)	0,107 0,626	0,787 4,626	0,433 < 0,001	0,128 (p < 0,001)
Step 4 previous plus EAT26 BUT CDI	0,071 (0,117) 4,268 (2,196) 0,723 (0,216)	0,078 0,309 0,422	0,610 1,943 3,346	0,543 0,055 0,001	0,060 (p = 0,001)
Step 5 previous plus EAT26 BUT CDI LSAS total score	0,092 (0,107) 1,916 (2,079) 0,415 (0,210) 0,253 (0,060)	0,102 0,139 0,242 0,422	0,867 0,922 1,972 4,236	0,389 0,359 0,052 < 0,001	0,080 (p < 0,001)
EAT-26 = Eating Attitude Test – 26					
BUT = Body Uneasiness Test					
CDI = Children Depression Inventory					
LSAS total score = Liebowitz social anxiety scale – children and adolescents					

Discussion

This study focused on a specific psychotic experience in a selected population and namely paranoia in adolescent with EDs. Results demonstrated that paranoia was dimensionally distributed in adolescent with AN and/or ED NOS. Our descriptive were higher than those of Ronald et al. (mean 12,14 and median 10,00) in the general population but lower than in adolescent help seeking screened positive for PLEs (mean 34.64 and median 38) (22, 23). This may have importance because EDs population could potential be at risk for psychotic symptoms (5). Kouidrat et al. argued that paranoid ideas could lead patients to think that food is poisoned or contaminated (16) and psychotic symptoms could occur after a fasting period (12). In the correlation analysis all our predictive variables (eating disorder symptoms, body image concerns, depression and social anxiety) were strongly and significantly associated with

paranoia. On the other hand in the regression analysis eating disorder symptoms and body image concerns were initially predictive for paranoia but when depression and social anxiety entered in the model they were no more significant. We assumed that in this population paranoia was better explained by the greater presence of depression and especially social anxiety in presence of equal level of eating disorder symptoms and body image concerns. So the account of the presence of paranoia in this population is not primarily explained by the nuclear psychopathology of EDs. Steinglass et al. found that among 25 subject with EDs the 20% were delusional and the presence of psychotic symptoms was not correlated with the overall measure of AN severity (BMI, duration of illness, lowest BMI, total EDI score) but with the EDI (eating disorder inventory) sub-scale drive for thinness (11). Instead, paranoia was linked to the highest presence of depression and social anxiety symptoms. This is in line with recent cognitive models of psychotic symptoms that underline the role of emotional factors in the development and maintenance of paranoia (24, 25). Several studies demonstrated that paranoia is more likely to develop in subjects with high depression and social anxiety (30–36). Depression could directly contribute to the persistence of psychotic symptoms and some cognitive processes are implicated, they are: negative schematic beliefs about the self, worry and problem solving difficulties (33, 34). Cognitive model also proposed a hierarchical structure of paranoia extending from social concerns to suspiciousness of threats, with social phobic content and emotional concerns being the core feature of the entire structure (25).

Conclusion

This study has some theoretical, clinical and treatment implications. It is important to carrying out screening and assessment procedures for the presence of psychotic symptoms and paranoia in patients with ED and AN. In detail, paranoia can shape the clinical presentation of the AN especially in the aspect of mistrust towards doctors and family members about food-related issues and this has a significant impact on the patient's collaboration in treatment and the therapeutic alliance. Therefore paranoia and indirectly higher depression and social anxiety may be considered factors which make the patient more refractory to treatment with the need, in certain cases, of psychopharmacological drugs and, among these, anti-psychotics. Finally in the psychotherapy context, paranoid idea may be subject of treatment for patient with EDs.

This study has some limitations. First of all, the cross sectional nature of the sample that prevents us from establishing the directionality of the relationship between the factors studied. We have assumed, in line with the literature (17), that paranoia follows the diagnosis of EDs. Despite this, longitudinal studies are needed to better clarify the presence of this relationship and the factors involved. Another limit was the assessment with self-report questionnaire that may have a tendency to overestimate the observed phenomena; with respect to this, the questionnaires used are all validated and well studied in the international scientific panorama. Finally the retrospective nature of the design study offers poor data quality control because the observers collected data for other aims.

Abbreviations

EDs
eating disorders
AN
anorexia nervosa
BN
bulimia Nervosa
BED
binge eating disorder
ED NOS
eating disorder not otherwise specified
O.R.
odd ratios
PLEs
psychotic like experiences
IVs
independent variables
DV
dependent variable
BMI
body mass index
IQ
intelligent quotient
EAT-26
eating Attitude test – 26
BUT-A
body Uneasiness test - A
CDI
children depression inventory
LSAS-CA
Liebowitz social anxiety scale – children and adolescents
SPEQ
specific psychotic experience questionnaire
SPSS
Statistical Package for the Social Sciences
EDI
eating disorder inventory

Declarations

Ethical approval and consent to participate: Our study design is retrospective and data are obtained from the collection of information from the routine evaluation done with each patient with eating disorders of the Integrated Pediatric Care Department, Luigi Vanvitelli University Hospital. All patients and / or their legal representatives signed consent to the routine clinical assessment at the time of taking charge. Ethical approval is not applicable due to the retrospective nature of the study.

Consent for publication: This manuscript did not contain any individual person's data in any form (including any individual details, images or videos).

Availability of data and materials: The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests: none

Funding: none

Authors'contribution: GM and FS collected data; GC and AG wrote the manuscript and GC and VL performed analyses

Acknowledgements: we want to thank Prof. Emanuele Miraglia Del Giudice of the Integrated Pediatric Care Department. Luigi Vanvitelli University Hospital and the study group on Eating Disorders of the Suor Orsola Benincasa University.

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