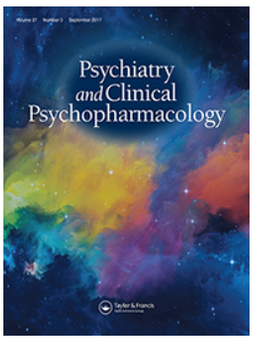

Psychiatry and Clinical Psychopharmacology

ISSN: 2475-0573 (Print) 2475-0581 (Online) Journal homepage: https://www.tandfonline.com/loi/tbcp21

Gender dysphoria and attention problems: possible clue for biological underpinnings

Burcu Yildirim, Nese Perdahli Fis, Gozde Yazkan Akgul & Ayse Burcu Ayaz

To cite this article: Burcu Yildirim, Nese Perdahli Fis, Gozde Yazkan Akgul & Ayse Burcu Ayaz (2017) Gender dysphoria and attention problems: possible clue for biological underpinnings, Psychiatry and Clinical Psychopharmacology, 27:3, 283-290, DOI: 10.1080/24750573.2017.1354417

To link to this article: https://doi.org/10.1080/24750573.2017.1354417

Published online: 27 Jul 2017.

PSYCHIATRY AND CLINICAL PSYCHOPHARMACOLOGY, 2017
VOL. 27, NO. 3, 283–290
https://doi.org/10.1080/24750573.2017.1354417

Gender dysphoria and attention problems: possible clue for biological underpinnings

Burcu Yildirim[a], Nese Perdahli Fis [a], Gozde Yazkan Akgul[a] and Ayse Burcu Ayaz[b]

[a]Department of Child and Adolescent Psychiatry, School of Medicine, Marmara University, Istanbul, Turkey; [b]Child and Adolescent Psychiatry Clinic, Pendik Training and Research Hospital, Marmara University, Istanbul, Turkey

ABSTRACT

OBJECTIVES: Development of gender identity is a complicated process. Several biological, familial, environmental, and cognitive factors thought to play role during this process. When a person has a persistent discomfort with his/her assigned gender and exhibits cross-gender identification, gender dysphoria is to be considered. In this study, we aimed to determine the rates of psychiatric diagnoses in youth presenting with gender dysphoria and compare them with a control group in terms of family functioning, emotional, and behavioural problems.

METHODS: The study sample consisted of 20 cases with gender dysphoria and 40 controls (5–17 years of age). The instruments included were Sociodemographic Form, Family Assessment Device (FAD), Child Behavior Checklist, and Schedule for Affective Disorders and Schizophrenia for School Aged Children Present-Lifetime Version.

RESULTS: Ninety per cent of the cases with gender dysphoria had at least one psychiatric diagnosis. Attention-deficit/hyperactivity disorder (ADHD) (75%) was the leading comorbidity, followed by major depressive disorder (25%). Gender dysphoria group had significantly higher scores in communication, roles, affective involvement, and general family functioning subscales of FAD and in all Child Behavior Checklist subscales. High Child Behavior Checklist attention subscale score was significantly associated with the diagnosis of gender dysphoria in binary logistic regression analysis (odds ratio: 0.82; $p < .001$).

CONCLUSIONS: Our results pointed out a possible biological background for gender dysphoria, along with psychosocial/psychodynamic explanations. The individuals with gender dysphoria will benefit from an integrative approach where all possible contributing factors are considered. Therefore, in addition to psychosocial and psychodynamic evaluation, assessment and interventions regarding ADHD will help to improve well-being and quality of life of these individuals.

ARTICLE HISTORY
Received 15 March 2017
Accepted 9 July 2017

KEYWORDS
Gender dysphoria; youth; attention problems

Introduction

"Gender dysphoria (GD)" is a condition where there is a marked incompatibility between an individual's assigned gender at birth with the gender that the person identified him/herself [1]. These individuals see and feel themselves to be a different gender from their assigned gender. This nonconformity is clinically associated with significant distress or impairment in social, occupational, or other important areas of functioning. Symptoms vary depending on the developmental level. Younger children may have a desire to wear opposite-gender clothes, take other gender's roles in games, and even may verbalize a discomfort about his/her own sexual anatomy. By the adolescence, these individuals usually begin to verbalize the desire to be of the other gender. They may believe that they have feelings and reactions typical of the other gender or may request to live and act as a member of the opposite gender [1]. The symptoms of GD usually appear in the pre-school period, yet, time taken to seek medical advice differs by cultural and social norms. For example, in samples from North America and Canada, it has been reported that parents seek medical advice due to GD symptoms when their children were between the ages of 3 and 8 years [2]. There is scarce amount of knowledge about long-term follow-up of children and adolescents with GD, since families hesitate to support and encourage these individuals to live as their desired gender.

For many cultures, while "masculine" behaviour in girls is regarded as irrelevant to any mental or social conflict, "feminine" behaviour in boys is usually thought to be related to a mental conflict or some psychosocial or environmental factors [3,4]. On the other hand, in the adolescence most of the girls tend to act congruently with their assigned gender, while boys more commonly persist on experiencing desired gender's roles. This may be one of the reasons

CONTACT Nese Perdahli Fis nfis@marmara.edu.tr; nepfis@yahoo.com

for the increased rate of admission of boys to the clinics [4].

Development of gender identity is a very complicated process, which is a result of interacting biological, individual, familial, environmental, and cognitive factors [3]. Biological underpinning of GD has been an area of interest in disciplines of endocrine, genetics, and neuroimaging. Although relatively inconsistent, there are suggestive findings about genetic contributions and sex atypical differentiation in some regions of the brain [5,6]. In some recent studies, gender dysphoria is found to be associated with distinct cerebral pattern such as larger regional grey matter and deviances of brain activation patterns [7,8]. Even though most transgender individuals do not have disorder of sex development, considerable information about psychosexual development comes from the studies on children with disorders of sexual development [9]. Psychological factors are significant variables along with biological features like chromosomal, gonadal, and hormonal sex characteristics. Despite several anatomical anomalies, many of these children grow up in accordance with their assigned gender at birth [10]. Thus, problems of gender identity development cannot be handled from a biological or psychological perspective alone. Early parent–child relationship, experiences in early childhood, and identifications, all accepted as contributing factors on gender identity development [11]. Parental gender preferences, methods of child rearing, cultural factors, and traditions are other psychosocial elements that may affect gender role development [3].

When the supporting social environment for the desired gender is precluded, children and adolescents with GD may develop mental disorders [1]. A study by Wallien et al. indicated that half of the children with gender identity disorder had an additional psychiatric disorder; 31% had any kind of anxiety disorder, 23% had a disruptive behaviour disorder, and 6% had mood disorder [12]. Especially being exposed to otherization and discrimination by their peers results in problems of self-perception, increased rates of comorbid mental disorders, and dropping out of school [2–13]. Additionally, adolescents with GD are found to have increased risk of suicidal thoughts, suicide attempts, and completed suicide before and after the gender transition [1].

Studies on adults are increasing in number; nevertheless, causes of GD in younger age groups, its neuropsychiatric background, progress, and outcome are not emphasized sufficiently. The studies on GD commonly published as case report series and are likely to be far from meeting the need. This study aims to investigate the presence of possible psychopathologies in children and adolescents with GD and compare them with a control group in terms of family functioning, emotional, and behavioural problems.

Method

Sample

The patient group consisted of 20 children and adolescents aged 5–17 years who have been followed up with a diagnosis of GD at Child and Adolescent Psychiatry Outpatient Clinic between 2012 and 2016.

The control group consisted of sex-matched 40 children and adolescents who were admitted to the same clinic other than GD complaints and were lacking a psychiatric diagnosis. Written informed consents from the parents and oral informed consents from the children participated in the study were taken.

Children with mental retardation and/or autism spectrum disorder, chronic illnesses, true or pseudohermaphroditism, and who were under the protection of social services were not included in the study.

Data collecting instruments

Sociodemographic Information Form

Participating children's parents' educational status, number of persons in the family, and average level of income were evaluated by the Sociodemographic Form.

Family Assessment Device (FAD)

FAD, which is an important instrument of family assessment, gives information about family's six different areas on functionality and common functionality [14]. McMaster Family Assessment Device was developed by the cooperation of Brown University School of Medicine Department of Psychiatry and Human Behaviors and Butler Hospital, in U.S.A., validity and reliability were determined by Epstein et al. [15]. The validity and reliability study of FAD in Turkish families is performed by Bulut [16]. With 60 items, this device evaluates seven different areas: problem solving, communication, roles, affective response, affective involvement, behaviour control, and general functions. The questionnaire was completed by the parent.

The Child Behavior Checklist (CBCL/4–18 years)

The Child Behavior Checklist (CBCL/4–18) is used to determine problems and competencies for ages 4–18 years. It is developed by Achenbach and Edelbrock in 1983 [17]. The questionnaire was translated to Turkish by Akcakin, adaptation and standardization studies were accomplished by Erol et al. [18,19]. CBCL is a widely used screening tool for assessing behavioural and emotional problems, where the information is obtained from the parents. Problem items are rated on a three-point Likert scale. There are eight syndrome scales: the sum of the scores of Withdrawn, Somatic Complaints and Anxious/Depressed scales forms the Internalizing Problem Score. The sum of the scores of Delinquent Behaviour and Aggressive Behavior

scales forms the Externalizing Problem Score. The remaining three subscales are the Social Problems, Thought Problems, and Attention Problems Subscales. The Total Problem Score is derived from the summation of all subscale scores. The cutoff score is accepted as 65 for subscales; 60 for internalizing, externalizing, and total problem score.

Schedule for Affective Disorders and Schizophrenia for School Aged Children Present-Lifetime Version (K-SADS-PL)

The K-SADS-PL is a semi-structured diagnostic interview designed to assess current and past episodes of psychopathology in children and adolescents. It was developed in 1997 by Kaufman et al. and was adapted to Turkish by Gokler et al. in 2004 [20,21]. It is administered by interviewing the parent and the child. Finally, the interviewer includes all sources of information and by using best clinical judgement an overall diagnosis is established. There are five Diagnostic Supplements Affective Disorders, Psychotic Disorders, Anxiety Disorders, Behavioural Disorders, and Substance Abuse and Other Disorders. In the present study, the researchers (BY, GY, BA) administrated K-SADS-PL and comorbid psychiatric diagnosis was established.

Procedures

The study has been approved by Marmara University Ethical Committee (09.2015.265). Written informed consents were gathered from the parents and children. Based on information from the parents, the Sociodemographic Information Form was completed by the researchers. All the children and parents who participated in the study were assessed according to the K-SADS-PL for diagnostic evaluation by two child and adolescent psychiatrists with emphasis on privacy and confidentiality. The therapeutic process was managed by other clinicians, so that there was not any interference by the researchers, other than the application of the K-SADS-PL. After the diagnostic evaluation, the FAD form and the CBCL form were completed by the parents of the children.

Statistical analysis

The variables were expressed as frequencies with the related percentage or mean values. Kolmogorov–Smirnov test was used to evaluate normality of distribution. Between-group comparisons were performed using the chi-square test, the Fisher's exact test, Student's t-test, and Mann–Whitney U test. The factors affecting GD were assessed by binary logistic regression analyses. The data were analysed by using Statistical Program for Social Sciences-SPSS for Windows, 17.0. For all the analyses, level of significance was accepted as $p \leq .05$.

Results

The study sample was consisted of GD ($n = 20$) and control groups ($n = 40$). The two groups were sex matched. Fifty-five per cent of the participants were male. The mean age of the two groups was similar (11.15 ± 4.21 years for GD with a median of 12, min: 5, max: 17, mode: 5 and 10.97 ± 3.84 years for control group with a median of 11, min: 5, max: 17, mode: 5) ($Z = -.197$, $p = .844$). The percentage of pre-pubertal children in GD group was 65% ($n = 23$), whereas it was 67.5% ($n = 27$) in the control group.

Sociodemographic variables

When compared to control group, the presence of the divorce or separation of the parents ($p = .001$) and the presence of a psychiatric disorder in the parents ($p = .050$) were significantly more common in the GD group. The level of income per person was lower in the GD group ($p = .006$). The sociodemographic characteristics of GD and control groups were given in Table 1.

There were no significant differences in developmental milestones in the GD and control groups (Table 2).

The rate of attendance to kindergarten was similar in the GD and control groups (40% and 42.5%, respectively; $\chi^2 = 0.034$, $p = .853$). The GD and control groups were similar regarding their primary caregivers (95% and 85% mother, 0% and 10% close relatives, 5% and 5% babysitter, respectively; $\chi^2 = 2.151$, $p = .341$). However, those in the GD group have more medical problems than the control group (10% and 0% for epilepsy, 20% and 5% for allergy, 5% and 0% for congenital heart disease) ($p = .015$).

Clinical characteristics of the GD group

In the GD group, the mean time from the onset of complaints (6.92 ± 4.15 years) to first presentation to the clinic (9.60 ± 4.32 years) was 2.70 ± 2.47 years. The most common presenting symptom was cross-gender attitude (35%) followed by cross-gender games and dressing (20%), cross-gender attitude and dressing (15%), cross-gender games (10%), cross-gender attitude and games (10%), and cross-gender attitude, games and dressing (10%).

Ninety per cent ($n = 18$) of the cases in the GD group had ≥1 additional psychiatric diagnosis. Attention-deficit/hyperactivity disorder (ADHD) (75%) was the leading comorbidity, followed by major depressive disorder in 25% of the cases. The other psychiatric comorbidities are oppositional defiant disorder (ODD): 10%; social phobia: 5%; specific phobia: 5%; general anxiety disorder: 5%; separation anxiety disorder: 10%; enuresis: 25%; encopresis: 5% and substance abuse: 5%.

Table 1. Comparisons between the GD group and the control group, according to sociodemographic and family characteristics.

	GD group ($n = 20$)	Control group ($n = 40$)	Statistical analyses
		n (%)	
Educational level of the mother			
Illiterate	1 (5%)	2 (5%)	
Primary school	8 (40%)	10 (25%)	
Secondary school	3 (15%)	5 (12.5%)	$\chi^2 = 3.887$, $p = .421$
High school	6 (30%)	10 (25%)	
University	2 (10%)	13 (32.5%)	
Educational level of the father			
Illiterate	0 (0%)	2 (5%)	
Primary school	10 (50%)	8 (20%)	
Secondary school	1 (5%)	5 (12.5%)	$\chi^2 = 9.125$, $p = .058$
High school	7 (35%)	11 (27.5%)	
University	2 (10%)	14 (35%)	
Togetherness of parents	15(75%)	40 (100%)	$\boldsymbol{\chi^2 = 10.909, p = .001}$
Current psychiatric symptoms of parents	5 (25%)	4 (10%)	$\chi^2 = 2.353$, $p = .125$
Parental history of psychiatric disorders	6 (30.0%)	4 (10.0%)	$\boldsymbol{\chi^2 = 3.840, p = .050}$
		Mean ± SD	
Maternal age	39.55 ± 9.08	38.95 ± 6.93	$t = 0.285$, $p = .777$
Paternal age	42.90 ± 8.33	42.65 ± 7.23	$Z = -0.102$, $p = .919$
Number of person in the family	4.15 ± 1.14	4.45 ± 1.88	$Z = -0.133$, $p = .894$
Level of income per person (Turkish Liras)	657.50 ± 392.71	1345 ± 1177.61	$\boldsymbol{t = -2.756, p = .006}$

Notes: GD, gender dysphoria. Significant comparisons are denoted in bold font.

For all the CBCL subscales, the patients in the GD group had higher scores than the control counterparts. The differences between the two groups were statistically significant. Similarly, internalizing problems, externalizing problems, and total scores were significantly high in the GD group (Table 3).

The rates of GD group, who had CBCL scores above the cutoff point, were as follows: Withdrawn Subscale: 40% ($n = 8$); Somatic Complaints Subscale: 30% ($n = 6$); Anxiety/Depression Subscale: 50% ($n = 10$); Social Problems Subscale: 35% ($n = 7$); Thought Problems Subscale: 35% ($n = 7$); Attention Problems Subscale: 60% ($n = 12$); Delinquent Behaviour Subscale: 40% ($n = 8$); Aggressive Behaviour Subscale: 30% ($n = 6$); Total Score: 70% ($n = 14$); Internalizing Problems Subscale: 70% ($n = 14$); and Externalizing Problems Subscale: 65% ($n = 13$).

When compared to control group, GD group had significantly higher scores in communication, roles, affective involvement, and general family functioning subscales of FAD (Table 4).

Binary logistic regression was performed to assess the impact of several factors on the likelihood that children and adolescents would have a diagnosis of GD. The model contained four independent variables (parental history of psychiatric disorders, level of income per person, CBCL attention subscale scores, FAD general functioning subscale scores) (Table 5). The full model containing all predictors was statistically significant ($p < .001$), indicating that the model could distinguish between children and adolescents who had or did not have GD. The model explained between 45.8% and 63.5% of the variance in GD, and correctly classified 88.3% of cases. As shown in Table 5, only one of the independent variables made a unique statistically significant contribution to the model (CBCL attention subscale score), recording an odds ratio of 0.82.

Discussion

In the present study, we evaluated the children and adolescents with a diagnosis of GD, focusing on comorbid psychiatric conditions and possible etiologic factors and compared them with those of a control group. The sample had shown a male preponderance. Similarly, many studies reported higher opposite-gender behaviour among younger girls, still the admission rates to the clinics were higher among boys [2,3].

Characteristics of early identification models, presence of parental psychopathology, and parental relational problems can be described as some of the psychosocial factors affecting the development of

Table 2. Developmental milestones of the groups.

	GD group ($n = 20$)	Control group ($n = 40$)	Statistical analyses
		Mean ± SD	
Gestational age	38.50 ± 2.50 weeks	38.90 ± 2.12 weeks	$Z = -1.431$, $p = .152$
Gestational weight	3035 ± 852.13 g	3311 ± 619.01 g	$Z = -1.186$, $p = .852$
First words	10.80 ± 1.54 months	10.15 ± 2.34 months	$Z = -.780$, $p = .436$
First sentences	19.25 ± 6.02 months	18.10 ± 4.87 months	$Z = -.358$, $p = .720$
Walking alone	12.35 ± 2.45 months	12.25 ± 1.64 months	$Z = -.624$, $p = .532$
Toilet training	24.20 ± 11.09 months	24.15 ± 4.55 months	$Z = -.714$, $p = .475$
Introduction of supplementary food	5.45 ± 1.85 months	5.90 ± 1.35 months	$Z = -.750$, $p = .453$
		% (*n*)	
Breastfeeding more than 6 months	20% ($n = 4$)	25% ($n = 10$)	$\chi^2 = 0.186$, $p = .666$

Note: GD, gender dysphoria.

Table 3. Comparison of GD and control group in terms of CBCL mean scores.

	GD group ($n = 20$)	Control group ($n = 40$)	Statistical analyses
	Mean ± SD		
Withdrawn subscale	67.25 ± 12.40	53.57 ± 5.82	**$Z = -4.875$, $p < .001$**
Somatic complaints subscale	62.45 ± 9.18	53.42 ± 5.58	**$Z = -4.056$, $p < .001$**
Anxiety/depression subscale	66.65 ± 9.33	54.70 ± 6.33	**$Z = -4.363$, $p < .001$**
Social problems subscale	65.95 ± 13.38	51.70 ± 3.68	**$Z = -4.976$, $p < .001$**
Thought problems subscale	65.90 ± 7.57	54.55 ± 6.31	**$Z = -4.808$, $p < .001$**
Attention problems subscale	69.00 ± 10.54	53.50 ± 5.20	**$Z = -5.114$, $p < .001$**
Delinquent behaviour subscale	63.65 ± 11.65	51.02 ± 2.94	**$Z = -5.008$, $p < .001$**
Aggressive behaviour subscale	64.05 ± 11.96	51.35 ± 3.25	**$Z = -5.186$, $p < .001$**
Internalizing problems subscale	57.68 ± 9.78	50.00 ± 11.04	**$t = 5.955$, $p < .001$**
Externalizing problems subscale	64.00 ± 12.44	42.77 ± 8.64	**$Z = -5.219$, $p < .001$**
Total score	68.40 ± 10.93	45.67 ± 11.12	**$t = 7.502$, $p < .001$**

Notes: GD, gender dysphoria; CBCL, Child Behavior Checklist. Significant comparisons are denoted in bold font.

gender identity in children and adolescents [11]. In our study, GD group divorce rates were higher, level of income per person was lower, and family history of psychiatric disorders was higher. Marantz and Coates reported that when compared to mothers of normal boys, mothers of male GD patients had more symptoms of depression and borderline personality disorder [22]. Among 97 children and adolescents, who had the diagnosis of GD, 47% of the parents were either divorced or separated, according to a study from Children's Hospital Boston [23]. Similarly, de Vries et al. [24] assessed 105 GD cases. They found that only 51.1% of the parents were married, and only 15.5% of the parents had higher level of education. In another study, from Turkey, almost 50% of the parents had primary level of education, and income on monthly bases was relatively low [25]. The findings stated in these two

Table 4. Comparison of GD and control group in terms of FAD mean scores.

	GD group ($n = 20$)	Control group ($n = 40$)	Statistical analyses
	Mean ± SD		
FAD problem solving	1.74 ± 0.57	1.71 ± 0.48	$Z = -.055$, $p = .956$
FAD communication	2.00 ± 0.60	1.65 ± 0.31	**$Z = -2.335$, $p = .020$**
FAD roles	2.17 ± 0.42	1.90 ± 0.37	**$t = 2.637$, $p = .011$**
FAD affective responsiveness	1.68 ± 0.65	1.50 ± 0.36	$Z = -.462$, $p = .644$
FAD affective involvement	2.48 ± 0.45	2.17 ± 0.32	**$Z = -2.552$, $p = .011$**
FAD behavioural control	2.12 ± 0.46	2.04 ± 0.29	$Z = -.640$, $p = .522$
FAD general family functioning	1.82 ± 0.52	1.51 ± 0.30	**$Z = -2.077$, $p = .038$**

Notes: GD, gender dysphoria; FAD, Family Assessment Scale. Significant comparisons are denoted in bold font.

Table 5. Outline of the regression model, indicating the variables that affect GD in children and adolescents.

Independent variables	Wald	OR, Exp (B)	p	95% CI
Constant	8.938	104933.218	.003	
Parental history of psychiatric disorders	0.311	1.770	.577	0.238–13.159
Level of income per person	1.085	1.001	.298	0.999–1.002
CBCL attention subscale scores	13.251	0.825	**.000**	0.743–0.915
FAD-GF subscale scores	0.068	0.727	.794	0.066–8.022
Cox&Snell R Square = 0.458 Nagelkerke R Square = 0.635				

Notes: CBCL, Child Behavior Checklist; FAD-GF, Family Assessment Device-General Functioning; OR, odds ratio; 95% CI, 95% confidence interval. Significant comparisons are denoted in bold font.

different studies are compatible with our findings that the cases in the GD group had lower socioeconomic status. Considering these findings, it can be argued that environmental factors such as parental separation and lower socioeconomic status may contribute in the development of GD, besides several biological factors. In the present study, incidence of chronic medical illnesses such as epilepsy, congenital heart disease, and atopy was higher in the GD group. To our knowledge, any study assessing chronic medical conditions in this group of patients is lacking. Such a finding might be a result of the process of collection of the control group. The control group consisted of individuals who had been admitted to the child and adolescent psychiatry unit but did not have any psychiatric diagnosis.

The age of onset of the complaints in the GD group was 6.92 years, time elapsed until first admission to psychiatry was about 3 years. Somewhat long duration between the onset and the admission may be related to several factors: the parents' attribution that the complaints were transient, the parents' underestimation of the severity of the symptoms, or the individual's being in the school age. However, if the complaints related to the GD continue into the adolescence, parents become much more worried and begin to seek medical/psychiatric help. In a case series of 12 children and adolescents, the time elapsed between onset of symptoms and admission to hospital was reported to be 2 years [26]. In the same report, authors indicated that when compared to boys, the time elapse was more in girls. In another more recent report, age of onset of symptoms was 2–3 years and age of admission for clinical help was 5–6 years [25]. In our study, the most common complaint in the GD group was cross-gender attitude, followed by cross-gender games and dressing. In a study where sex differences were examined authors indicated that girls had more extreme cross-gender behaviour. On the other hand, since such behaviour was less tolerated in boys, even with a low threshold of behaviour boys were referred for clinical assessment, while for girls a higher level of cross-gender behaviour leads to clinical attention [27].

In the present study, the most common comorbid condition was ADHD, followed by major depression, in one-fourth of the cases. Such a high rate of ADHD

in GD group can be explained by the age range of the participants. Since our study includes young children, mostly pre-adolescents, neurodevelopmental disorders such as ADHD are more likely to occur rather than depression or anxiety. Additionally, a possible link between ADHD and gender dysphoria has been reported in a study by Strang et al. In their study, authors reported that youth with ADHD were 6.64 times more likely to have gender variance [28]. On the other hand, possible underlying biological mechanisms have already been discussed for these individuals. Increased heritability rates among twins and increased left-handedness in boys with GD were referred as supporting findings for a neurodevelopmental susceptibility [5,29,30]. In their study, de Vries et al. found that one-third of the adolescents with GD showed at least one psychiatric comorbidity. The most common comorbid condition was anxiety disorder (21%), followed by mood disorders (12.4%) and disruptive behaviour disorders, including ADHD and ODD (11.4%) [24]. Symptoms of anxiety, depression, suicidal thoughts, self-destructive behaviours, and drug abuse were commonly reported in many studies with adolescents with GD [31,32]. A recent study, including patients who admitted to the paediatric clinics due to GD symptoms, indicated that previous psychiatric history of these patients was remarkable, with more frequent previous psychiatric admissions, increased self-harming behaviour, suicidal ideation and attempts, and thus more frequent hospitalizations [23]. Apart from internalizing disorders, an interesting finding came from Dutch study in 2010. In their clinically referred sample with GD, the authors reported the prevalence of autism spectrum disorder to be 10 times higher than typical children [33].

In our study, besides focusing on clinical psychiatric comorbid diagnosis, we also assessed the behavioural and emotional problems of the youth by using CBCL. When compared to the control group, the parents of the GD group had reported increased rates of behavioural and emotional problems. The researchers comparing data from Toronto and Amsterdam stated that both samples with diagnosis of GD had increased rates of behavioural and emotional problems when compared to normative data; however, the rates were found to be similar when compared to clinical samples [34]. As another parameter, we evaluated the family functioning of these children. When compared to controls, several parameters of family functioning were disturbed in patients with GD diagnosis. They were insufficient in terms of occupied roles, affectionate reciprocal relationships in the family setting, and overall family functioning. In another study in which Parental Attitude Research Instrument (PARI) was used, the mothers of boys with gender identity problems reported higher levels of marital discord and they were found to be less authoritarian [25]. During gender identity development, there has been a great emphasis on the first three years of life, regarding early the parent–child relationships and role of family dynamics [11]. The problems in certain areas of family functioning that had emerged from our study should be emphasized along with other factors in the development of GD.

We evaluated the possible factors that might have contributed for the development of GD. Presence of parental psychopathology, low income per person, significant attention problems, and low familial functioning were analysed through a regression analysis. Among these, attention problems appeared as a salient possible contributing factor. From this point of view, GD might be regarded as a biologically based, however, multifactorial, developmental disorder, likewise autistic spectrum disorder or ADHD.

There were two main limitations of our study. The first, since patient and control group samples were gathered from the individuals admitted to the child and adolescent psychiatry outpatient clinic, they were far from representing the community sample. The second was that the sample size was relatively small and the age range of sample was relatively large. These constraints limit us to generalize the results found in the study sample. Furthermore, we did not analyse the gender differences in our sample because of the small number of cases. In studies including large number of cases with male and female GD, gender differences can be evaluated.

Due to projections from clinical experience and scientific literature, it has become clearer that development of gender identity is a complex process, resulting from interaction of individual, familial, and environmental factors and cognitive developmental process of the child. Until recently, accumulated knowledge on GD etiopathogenesis mainly comes from psychosocially and/or psychodynamically oriented perspective. This study, however, elucidated the fact that the individuals with GD had more significant attention problems, and they had high rates of ADHD as a psychiatric diagnosis. Although from a relatively small sample, our results are substantial in a way that they point out a possible biological background for GD, along with psychosocial/psychodynamic explanations.

Therefore, those patients with GD will benefit from an integrative approach in which the clinician takes all possible contributing factors into account. Such an approach will help the clinician in evaluating, understanding, and counseling the patient and the family. Particularly assessment and intervention regarding ADHD will possibly help to improve these individuals' well-being and quality of life.

Disclosure statement

No potential conflict of interest was reported by the authors.

ORCID

Nese Perdahli Fis http://orcid.org/0000-0002-4806-0876

References

[1] American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-5®). 5th ed. Washington (DC): American Psychiatric Publishing; 2013. p. 451–459.

[2] Cohen-Kettenis PT, Owen A, Kaijser VG, et al. Demographic characteristics, social competence, and behavior problems in children with gender identity disorder: a crossnational, crossclinic comparative analysis. J Abnorm Child Psychol. 2003;31(1):41–53.

[3] Ozsungur B. Gender identity development and gender identity disorder: psychosocial characteristics. Çocuk ve Gençlik Ruh Sağlığı Dergisi [Turk J Child Adolesc Ment Health]. 2010;17(3):163–174. Turkish.

[4] Canat S, Evrengol A. Atypical gender role behavior in children and adolescents. Nöroloji Nöroşirurji Psikiyatri Dergisi [Turk J Neurol Neurosurg Psychiatry]. 1986;1(2):203–206. Turkish.

[5] Heylens G, De Cuypere G, Zucker KJ, et al. Gender identity disorder in twins: a review of the case report literature. J Sex Med. 2012;9(3):751–757.

[6] Burke SM, Cohen-Kettenis PT, Veltman DJ, et al. Hypothalamic response to the chemo-signal androstadienone in gender dysphoric children and adolescents. Front Endocrinol (Lausanne). 2014;5:60.

[7] Luders E, Sánchez FJ, Gaser C, et al. Regional gray matter variation in male-to-female transsexualism. Neuroimage. 2009;46(4):904–907.

[8] Schöning S, Engelien A, Bauer C, et al. Neuroimaging differences in spatial cognition between men and male-to-female transsexuals before and during hormone therapy. J Sex Med. 2010;7(5):1858–1867.

[9] Olson-Kennedy J, Cohen-Kettenis PT, Kreukels BP, et al. Research priorities for gender nonconforming/transgender youth: gender identity development and biopsychosocial outcomes. Curr Opin Endocrinol Diabetes Obes. 2016;23(2):172–179.

[10] Meyer-Bahlburg HF. Gender assignment and reassignment in 46, XY pseudohermaphroditism and related conditions. J Clin Endocrinol Metab. 1999;84(10):3455–3458.

[11] Ozturk MO. Sexual adjustment problems. In: Ozturk MO, editor. Mental health and disorders. Renewed 8th ed. Ankara: Tuna Publishing; 2001. p. 443–462. Turkish.

[12] Wallien MS, Swaab H, Cohen-Kettenis PT. Psychiatric comorbidity among children with gender identity disorder. J Am Acad Child Adolesc Psychiatry. 2007;46(10):1307–1314.

[13] Zucker KJ, Bradley SJ. Gender identity disorder and psychosexual problems in children and adolescents. New York (NY): The Guilford Press; 1995.

[14] Gudek K, Durukan M, Abali O, et al. Application and assessment of FAD (Family Assessment Device) in child psychiatry. Türkiye Aile Hekimliği Dergisi [Turk J Fam Pract]. 2007;10(3):108–110. Turkish.

[15] Epstein NB, Baldwin LM, Bishop DS. The MacMaster Family Assessment Device. J Marital Fam Ther. 1983;9(2):171–180.

[16] Bulut I. Family Assessment Scale Handbook. Ankara: Ozguzelis Publishing; 1990. p. 1–38. Turkish.

[17] Achenbach TM, Edelbrock CS. Manual for the Child Behavior Checklist and Revised Child Behavior Profile. Burlington (VT): University of Vermont, Department of Psychiatry; 1983.

[18] Akcakin M. Introduction and reliability study of Children Behavior Check List. Turk Psikoloji Dergisi [Turk J Psychol]. 1985;5:3–6. Turkish.

[19] Erol N, Simsek Z. Mental health in children and adolescents: domains of competence, distribution of behavioral and emotional problems. In: Erol N, Kilic C, Ulusoy M, Kececi M, Simsek Z, editors. Mental health profile report from Turkey. Ankara: Eksen Publishing; 1998. p. 25–75. Turkish.

[20] Kaufman J, Birmaher B, Brent D, et al. Schedule for affective disorders and schizophrenia for school-age children-present and lifetime version (K-SADS-PL): initial reliability and validity data. J Am Acad Child Adolesc Psychiatry. 1997;36(7):980–988.

[21] Gokler B, Unal F, Pehlivanturk B, et al. Reliability and validity of schedule for affective disorders and schizophrenia for school age children-present and lifetime version-Turkish version (K-SADS-PL-T). Çocuk ve Gençlik Ruh Sağlığı Dergisi [Turk J Child Adolesc Ment Health]. 2004;11(3):109–116. Turkish.

[22] Marantz S, Coates S. Mothers of boys with gender identity disorder: a comparison of matched controls. J Am Acad Child Adolesc Psychiatry. 1991;30(2):310–315.

[23] Spack NP, Edwards-Leeper L, Feldman HA, et al. Children and adolescents with gender identity disorder referred to a pediatric medical center. Pediatrics. 2012;129(3):418–425.

[24] de Vries AL, Doreleijers TA, Steensma TD, et al. Psychiatric comorbidity in gender dysphoric adolescents. J Child Psychol Psychiatry. 2011;52(11):1195–1202.

[25] Gunes H. Demographic characteristics and behavior problems of childrens with gender identity problems and child rearing practices, marital and sexual adjustment and gender roles of their parents [postgraduate thesis]. Istanbul: Istanbul University Cerrahpasa Faculty of Medicine; 2010. Turkish.

[26] Erermis S, Tamar M, Denizoglu A, et al. Sociodemographic, clinical and psychometric features in children and adolescents with gender identity disorder. Çocuk ve Gençlik Ruh Sağlığı Dergisi [Turk J Child Adolesc Ment Health]. 1997;4(2):97–104. Turkish.

[27] Zucker KJ, Bradley SJ, Sanikhani M. Sex differences in referral rates of children with gender identity disorder: some hypotheses. J Abnorm Child Psychol. 1997;25(3):217–227.

[28] Strang JF, Kenworthy L, Dominska A, et al. Increased gender variance in autism spectrum disorders and attention deficit hyperactivity disorder. Arch Sex Behav. 2014;43(8):1525–1533.

[29] Zucker KJ, Beaulieu N, Bradley SJ, et al. Handedness in boys with gender identity disorder. J Child Psychol Psychiatry. 2001;42(6):767–776.

[30] Zucker KJ. Gender identity development and issues. Child Adolesc Psychiatr Clin N Am. 2004;13(3):551–568.

[31] Grossman AH, D'Augelli AR. Transgender youth and life-threatening behaviors. Suicide Life Threat Behav. 2007;37(5):527–537.

[32] Wallien MS, Cohen-Kettenis PT. Psychosexual outcome of gender-dysphoric children. J Am Acad Child Adolesc Psychiatry. 2008;47(12):1413–1423.
[33] De Vries AL, Noens IL, Cohen-Kettenis PT, et al. Autism spectrum disorders in gender dysphoric children and adolescents. J Autism Dev Disord. 2010;40(8):930–936.
[34] Vries AL D, Steensma TD, Cohen-Kettenis PT, et al. Poor peer relations predict parent- and self-reported behavioral and emotional problems of adolescents with gender dysphoria: a cross-national, cross-clinic comparative analysis. Eur Child Adolesc Psychiatry. 2016;25(6):579–588.