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ORIGINAL ARTICLE

Psychosocial assessment in transgender adolescents☆

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Transgender;
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Abstract
Objectives: To evaluate the psychosocial status of the patients who attend a paediatric endocrinology clinic due to gender incongruity (GI), and to establish the impact on this after one-year of cross hormonal therapy (CHT).
Material and methods: An analytical and prospective study conducted on adolescents between 14 and 18 years old with GI, and who attended the Endocrinology Clinic during 2018–2019. The sample included 23 transgender cases (16 male and 7 female cases) and 30 cisgender controls. Study variables were collected at T0 (pre-treatment) and T1 (after one year of CHT) and included sociodemographic data, Utrecht test, SDQ-Cas test, family APGAR test, STAI scale-anxiety Grade, and BDI-II depression assessment test.
Results: A significant improvement ($P < .05$) was found between T0 and T1 in the transgender group in terms of emotional symptoms, behaviour problems, hyperactivity symptoms, pro-social conduct, as well as in the degree of anxiety and depression measured by the SDQ-Cas test, the STAI and the BDI-II scale. There were significant differences in these scales between the transgender group and the controls at T0, however, the scores equalised at T1. The families in this sample of transgender patients provided a very favourable environment according to the scores obtained on the family APGAR scale.

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Conclusions: The rates of anxiety, emotional and behaviour distress, depressive symptomatology, as well as the feeling of gender dysphoria of these transgender patients were similar to those of non-transsexual population of the same age after one year of CHT initiated at ages between 14 and 18 years old.

PALABRAS CLAVE
Transgénero;
Adolescente;
Disforia de género;
Identidad de género

Evaluación psicosocial en adolescentes transgénero

Resumen
Objetivos: Evaluar el estado psicosocial de los pacientes que acudan a consulta de endocrinología pediátrica por incongruencia de género y determinar el impacto en este sentido de la terapia hormonal cruzada (THC) después de un año.
Material y métodos: Se trata de un estudio analítico, prospectivo realizado en adolescentes con incongruencia de género de entre 14 y 18 años que acuden a endocrinología infantil durante 2018-2019. Tamaño muestral: 23 casos transgénero (16 masculinos y 7 femeninos) y 30 controles cis. Variables del estudio en T0 (pretratamiento) y T1 (tras un año de THC): datos sociodemográficos, Test de Utrecht, Test SDQ-Cas, APGAR familiar, Escala STAI, Test de evaluación de depresión BDI-II.
Resultados: Se encuentra mejoría significativa ($p < 0,05$) entre T0 y T1 en el grupo trans en cuanto a los síntomas emocionales, los problemas de conducta, los síntomas de hiperactividad y la conducta prosocial, así como en el grado de ansiedad y depresión. Existen diferencias significativas entre el grupo trans y los controles en T0 igualándose las puntuaciones en T1 en las escalas evaluadas. Las familias de nuestra muestra de pacientes transgénero proporcionan un entorno muy favorable según las puntuaciones obtenidas en la escala del APGAR familiar.
Conclusiones: Los índices de ansiedad, distrés emocional y comportamental, sintomatología depresiva, así como el sentimiento de disforia de género de nuestra muestra de pacientes transgénero fueron similares a los de población no transexual de su misma edad tras un año de THC iniciada en edades comprendidas entre los 14-18 años.

Introduction

Transgender individuals are individuals whose gender identity or gender expression does not conform to that typically associated with the sex to which they were at birth, in the absence of an underlying mental disorder or chromosomal abnormality that could be the cause of this experience. The concept of gender dysphoria featured in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) and the International Classification of Diseases, Tenth Revision (ICD-10)[1,2] refers to the distress caused by this incongruence between gender identity and the sex assigned at birth (and the associated gender role and/or primary and secondary sex characteristics),[3,4] and not all transgender individuals experience it. During the development of the International Classification of Diseases, Eleventh Revision (ICD-11), the World Health Organization (WHO) redefined gender identity-related health, replacing categories like ''transsexualism'' and introducing the concept of ''gender incongruence''. This category is included in the so-called Z codes, which are codes used to define a variety of psychosocial factors or life events and do not fit into a diagnostic category.[5]

In transgender adolescents, puberty suppression at an early age (Tanner stages 2 and 3) seeks to alleviate the suffering caused by the development of secondary sex characteristics, to widen the temporal window for decision-making, as at this stage the treatment is still reversible, and to facilitate social transition to the new gender role.[6,7] Thus, a study conducted in the Netherlands by Cohen-Kettenis et al in transgender youth that had undergone puberty suppression analysed behavioural problems, depression, anxiety and overall functioning and found considerable improvement in every scale following treatment.[8,9]

In a study published in *Pediatrics*, Spack et al. reported similar outcomes applying the 'Dutch model' to those found by De Vries and Cohen-Kettenis in 2014.[10]

Outside the works we have just mentioned, the literature on the psychosocial impact of hormone therapy in transgender youth is scarce. More specifically, no such study has been conducted in Spain, and none of those conducted elsewhere included a control group. For this reason, the objectives of our study were to assess the psychosocial status of patients seeking care in the paediatric endocrinology clinic for gender incongruence and the impact on psychosocial status of cross-sex hormone therapy (CSHT) at 1 year of treatment.

Materials and methods

Study design

We conducted a prospective analytical study in adolescents with gender incongruence aged 14–18 years managed as new patients in the paediatric endocrinology clinic of the Hospital Clínico San Carlos. In our unit, the hormone therapy approach used for male-to-female (MTF) transition starts with gonadotropin-releasing hormone (GnRH) analogues in the intermediate pubertal stages (Tanner 2–3), adding CSHT with oral estradiol starting from age 14 years, with the specific timing determined on a case-by-case basis. The approach to female-to-male (FTM) transition starts with GnRH analogues in the intermediate pubertal stages with addition of CSHT with intramuscular testosterone starting from age 14 years. We analysed the cases of 23 trans patients (16 FTM and 7 MTF) and 30 cisgender controls matched for age, ethnicity and socioeconomic status. We recruited both cases and controls in the paediatric endocrinology clinic of the Hospital Clínico San Carlos simply by requesting that they volunteer to participate in the study. We followed up patients in both groups for a year after initiation of CHST in the trans cases.

Variables under study at T0 (before hormone therapy) and T1 (1 year after initiation of cross-sex hormone therapy)

1. *Sociodemographic characteristics*. Family: age, country of origin, ethnicity, educational attainment and income level.

   Personal: age, country of origin, ethnicity, sexual orientation and past use of mental health services.
2. *Severity of gender dysphoria – Utrecht Gender Dysphoria Scale* (*UGDS*).[11] Filled out for the sex assigned at birth at T0 and the self-identified gender at T1.
3. *Patient strengths and difficulties – Strengths and Difficulties Questionnaire, Spanish Version* (*SDQ*-Cas).[12] This questionnaire detects potential emotional and behavioural problems in children and adolescents. A score of more than 20 is considered indicative of risk of having a disorder (normal: 0–15; borderline: 16–19, abnormal: 20–40).
4. *Family functioning – Family APGAR test*.[13] The family APGAR test assesses how family members perceive overall family functioning. It is interpreted as follows: functional, 17–20 points; mildly dysfunctional, 16–13 points; moderately dysfunctional, 12–10 point; severely dysfunctional, <9 points.
5. *Level of anxiety – State-Trait Anxiety Inventory*.[14] This instrument is based on a theoretical model with 2 components: state anxiety and trait anxiety. It is composed of 2 separate self-report subscales, each with 20 items, to assess these components. Specific cut-off points have not been established for its interpretation, and instead the result is reported as the percentile corresponding to the raw score.
6. *Mood – Beck Depression Inventory II* (*BDI*-II).[15] The 21 items of the inventory describe the most frequent symptoms found in patients with depression (psychological or affective-cognitive items, and somatic-vegetative items). The instrument was developed mainly for use in clinical practice as a means to assess severity of depression in adolescent and adult patients. The ranges used to interpret the score are: no depression, 0–9; mild depression, 10–18; moderate depression, 19–29; severe depression, >30.

Inclusion criteria

- Adolescents with gender incongruence at a stage of pubertal development of Tanner 2 or higher that were willing to participate.
- Absence of psychiatric comorbidity that could affect the experience of gender dysphoria.
- Having demonstrated an understanding of the potential risks and benefits of CSHT.

Ethical considerations

We obtained the written informed consent of the parents and the assent of the minor as a requisite for participation in the study. We provided an informational document and explained the protocol in detail to all participants. We did not include any personally identifiable information in the study dataset. Thus, the study adhered to international regulations for data protection and current Spanish law on personal data protection. The protocol was approved by the Ethics and Clinical Research Committee of the Hospital Clínico San Carlos de Madrid.

Statistical analysis

We did a descriptive analysis of all study variables, using measures of central tendency and dispersion for quantitative variables and absolute and relative frequency distributions for quantitative variables. We used the mean and standard deviation (SD) to summarise quantitative variables. We compared the mean scores at baseline (T0) in both groups using the two-sample t test and the changes in scores between baseline (T0) and 1 year of treatment (T1) by one-way repeated measures analysis of variance (ANOVA), introducing the group variable as an intergroup factor and the T0 and T1 timepoints as an intragroup factor. We set a level of significance of 5% for all tests. Data were handled and analysed with the software SPSS 23.0.

Results

We analysed data for 53 participants aged 14–18 years, of who 23 were trans gender (16 [69%] trans male and 7 [31%] trans female) and 30 were healthy cisgender controls (12 [40%] female and 18 [60%] male). All were Caucasian of Spanish descent except for 2 trans participants, 1 Asian participant of Chinese descent and 1 black participant from Colombia. We did not find significant differences in the socioeconomic status between the trans participants and the cis controls ($P = .2$). Approximately 40% to 50% of participants in each group were of middle socioeconomic status and had parents with a university education (Table 1).

Table 1 Sociodemographic characteristics.

	Trans group	Cis group	
Mean age (range)	16 (14–18 years)	16 (14–18 years)	NS
Sex assigned at birth	Female (69%), male (31%)	Female (60%), male (40%)	NS
Caucasian and of Spanish descent	91%	100%	NS
Parents with university education	52%	40%	NS
Previous use of mental health services	30.4%	30%	NS
Sexual orientation	Heterosexual (65%), homosexual (13%), bisexual (21%)	Heterosexual (90%), homosexual (10%), bisexual (0%)	$P < .05$

Table 2 Results of the Strengths and Difficulties Questionnaire in trans adolescents and the control group before hormone therapy (T0) and at 1 year of cross-sex hormone therapy (T1).

Variable	Trans					Cis					Group comparison	
	T0		T1			T0		T1			T0	T1
	Mean	SD	Mean	SD	*P*	Mean	SD	Mean	SD	*P*	*P*	*P*
Prosocial	8	1.6	9	1.2	<0.001	7.7	1.2	7.5	1.2	.3	.4	<.001
Emotional symptoms	5.2	1.6	3.4	1.2	<0.001	3.7	1	3.7	1	1	<.001	.3
Conduct problems	2.7	0.8	1.8	1	<0.001	2.3	1.2	2.6	1.6	.1	.1	.05
Hyperactivity	4	1.9	2.6	1.8	<0.001	3.8	0.9	3.9	0.8	.8	.5	.002
Peer problems	2.6	1.3	2.3	0.8	0.1	1.3	0.4	1	0.2	.07	<.001	<.001
Total difficulties	14.7	3.3	10.3	2.9	<0.001	11.3	2.3	11.3	2.3	.9	<.001	.1

Cis, cisgender control group; SD, standard deviation; Trans, transgender case group.

We found that 30.4% of the trans participants ($n = 7$) and 30% of the cis controls ($n = 9$) had previously used mental health services, while only 1 trans participant (4.3%) had ever received psychiatric medication (Table 1).

The trans participants had a supportive social environment, as 100% had disclosed their transgender identity to their parents and 82% (19 out of 22) had disclosed it in their respective schools. In addition, 95% (22 out of 23) reported being addressed by their chosen names at home and 82% in their school.

Severity of Gender Dysphoria-Utrecht Scale

Participants in the trans group had a mean score in the UGDS of 57.1 ± 4.1 at T0 (the cut-off point to identify dysphoria is 40 points, out of a total possible maximum of 60 points) compared to a mean score of 14.7 ± 3.2 at T1, which evinced significant improvement at 12 months of treatment ($P < .001$). Every trans participant had gender dysphoria at T0 and none had gender dysphoria at T1 applying the cut-off point established for definition of gender dysphoria in this scale.

Strengths and Difficulties Questionnaire

The mean overall score in the trans group was in the upper range of normal at T0 (14.7 ± 3.3), with a significant improvement at T1 (10.3 ± 2.8 DE) ($P < .001$). When we compared the trans and cis groups at T0, we found significant differences, with a mean difference in the questionnaire score of 3.3 ± 0.7 ($P < .001$), a difference that was nearly reversed after 1 year of treatment (-1.0 ± 0.7; $P = .153$), so that emotional symptoms and conduct problems had both become comparable to those of the control group at T1. Tables 2 and 3 summarise the scores in the SDQ.

When we analysed each of the 5 groups of difficulties that compose the SDQ, we found significant improvement between T0 and T1 in the trans group in the areas of emotional symptoms, conduct problems, hyperactivity and prosocial behaviour ($P < .001$), with no significant change in the area of peer relationship problems, with similar scores at T0 and T1.

Table 3 Percentage of trans participants with SDQ scores in the normal, borderline and abnormal range at T0 and T1.

SDQ in trans group	T0	T1
Normal (0–15 points)	61% ($n = 14$)	95.6% ($n = 22$)
Borderline (16–19 points)	34.7% ($n = 8$)	4.3% ($n = 1$)
Abnormal (20–40 points)	4.3% ($n = 1$)	0%

Table 4 Results of the State-Trait Anxiety Inventory (STAI) in the trans adolescent group and the cis adolescent control group before hormone therapy (T0) and at 1 year of cross-sex hormone therapy (T1).

Variable	Trans					Cis					Group comparison	
	T0		T1			T0		T1			T0	T1
	Mean	SD	Mean	SD	*P*	Mean	SD	Mean	SD	*P*	*P*	*P*
STAI-S	33.3	9.1	16.8	8.1	<0.001	11.8	3.8	12.3	3.8	0.6	< 0.001	0.008
STAI-T	33	7.2	18.5	8.4	<0.001	14.2	4.8	14.2	4.8	0.9	< 0.001	0.02

Cis, cisgender control group; SD, standard deviation; STAI-S, STAI state anxiety subscale; STAI-T, STAI trait anxiety subscale; Trans, transgender case group.

Table 5 State anxiety subscale percentiles in the trans group.

STAI-State in trans group	Mean (SD)	Percentile
T0	33.3 (9.1)	75th–85th
T1	16.8 (8.1)	<50th

SD, standard deviation; STAI, State-Trait Anxiety Inventory.

Table 6 Trait anxiety subscale percentiles in the trans group.

STAI-Trait in trans group	Mean (SD)	Percentile
T0	33.0 (7.2)	p 85–95
T1	18.5 (8.4)	<p50

SD, standard deviation; STAI, State-Trait Anxiety Inventory.

Family environment: Family Apgar test

We found a mean score of 17.9 at T0 and of 18 at T1 in the trans group, both within the normal range. We did not find differences between T0 and T1 or between the case and control groups.

Anxiety assessment: State-Trait Anxiety Inventory

State anxiety in the trans group improved significantly, with the mean score decreasing by 16.5 ± 1.1 points ($P < .001$), corresponding to a decrease from the 75th to 85th percentile at T0 to below the 50th percentile at T1. On the other hand, participants in the control group had similar scores at T0 and T1 (Tables 4 and 5).

Comparing the trans and cis groups at T0, we found a difference in the mean score of 21.5 ± 1.8 ($P < .001$), and there was still a mean difference at T1, in this case of 4.6 ± 1.6 points ($P < .008$), which indicated a higher level of anxiety in cases compared to controls at 1 year despite treatment (Table 4).

Trait anxiety decreased by a mean of 14.5 ± 0.9 points between T0 and T1 in the trans group ($P < .001$), with no difference between time points in the control group. We found a decrease from the 85th to 90th percentile at T0 to below the 50th percentile at T1. In contrast, controls had similar scores at T0 and T1, as was also the case with the state anxiety.

Comparing the trans and cis groups at T0, we found a mean difference of 18.8 ± 1.6 points ($P < .001$), and we also found differences between groups at T1, with a mean difference of 4.3 ± 1.8 points ($P < .02$). As was the case with state anxiety, while there was improvement in the score for trait anxiety, the level of anxiety continued to be higher in the trans group compared to the control group at T1 (Tables 4–6).

Assessment of depression: Beck Depression Inventory II

We found a decrease in symptoms of depression between T0 and T1 in the trans group, with a mean difference in the BDI-II score of 9.5 ± 0.6 points ($P < .001$), while there were no differences in the control group (Table 7). The mean score at T0 was 19.3 (at the lower limit of moderate depression) and decreased to 9.7 at T1 (at the lower limit of mild depression). In the cis control group, the mean at T0 was within the normal range and it remained normal at T1 (Table 7). In the trans group, we observed clear improvement at T1 at every level of depression (Table 8).

Comparing the trans and cis groups at T0, we found a mean difference of 12.0 ± 1.3 points in the score ($P < .001$) that had decreased to 2.4 ± 0.7 points at T1 ($P < .034$). Trans participants had more depression symptoms compared to controls at T0 and, despite improvement, also at T1 (Table 7).

Discussion

In many cases, both families and the health professionals that habitually work with trans adolescents need to make decisions without the support of clear scientific evidence. But, as any professional that works with trans youth and their families knows, in a population that faces this level of discrimination[16–18] and in which self-harm, suicidal ideation, anxiety and other problems are so prevalent, the risk associated with not performing any kind of intervention is very high.[19–21]

Medical treatment of transgender adolescents has been a controversial issue since it was first reported in the Netherlands in 1998.[22] Since 2013, our paediatric endocrinology clinic offers multidisciplinary treatment to patients with adolescent-onset gender dysphoria, with collaboration of social workers, psychologists, psychiatrists, gynaecologists, dermatologists, paediatricians and endocrinologists. At

Table 7 Results of the Beck Depression Inventory II in the trans and cis groups, before hormone therapy (T0) and at 1 year of cross-sex hormone therapy (T1).

Variable	Trans					Cis					Group comparison	
	T0		T1			T0		T1			T0	T1
	Mean	SD	Mean	SD	*P*	Mean	SD	Mean	SD	*P*	*P*	*P*
BDI-II	19.3	5.5	9.7	3.9	<.001	7.2	3.9	7.4	3.6	.7	<.001	.034

BDI, Beck Depression Inventory; SD, standard deviation.

Table 8 Percentage of trans participants with BDI-II scores in the normal, mild depression, moderate depression and severe depression range at T0 and T1.

BDI-II in trans group	T0	T1
Normal (0–9)	0%	69.5%
Mild (10–18)	60.8%	26.0%
Moderate (19–29)	34.7%	4.3%
Severe (>30)	4.3%	0%

present, our clinic manages 50 patients receiving hormone therapy for this indication, mostly following the latest recommendations of the World Professional Association for Transgender Health,[3] with a model similar to the one recommended by Hembree[4] and the Cohen-Kettenis group.[8] That is, patients that have reached a stage of pubertal development of at least Tanner 2 or 3, without psychiatric comorbidity that could play a role in gender dysphoria, with adequate social, family and psychological support and that have demonstrated an understanding of the risks and benefits of hormone therapy.

At present, the scientific community does not consider transgender identities pathological. Removing transgender identities from the classification of psychiatric disorders and placing related problems in the Z codes is a solution that allows their depathologisation, including them in the classification criteria related to factors that have an impact on health status.[5] Until recently, the few manuals available to guide the management of trans patients mainly focused on the incongruence between the sex assigned at birth and the gender identity of the individual, and particularly on the distress caused by this discrepancy.[2] This distress may or may not be directly associated with the possibility of freely expressing gender identity, being able to transition if so desired, the support received by the family and the general social environment and the degree of transphobia experienced. In our study, all trans participants experienced gender dysphoria at T0, which had resolved in all at 1 year of CSHT, which demonstrates that this dysphoria is not a necessary condition in transgender individuals and is not always present in transgender youth.

In our sample, the families of transgender participants provided a highly supportive environment, as demonstrated by the family APGAR scores. This could explain the highly favourable outcomes observed at 1 year of treatment with CSHT. The support of families and physicians is essential to the adequate and healthy neuropsychological development of transgender adolescents.[6,7,23] Initiation of CSHT and the associated physical changes at younger ages than currently recommended in management protocols (16 years) may have psychological benefits, given the particular importance of fitting in the peer group during adolescence. In fact, we found excellent results in the SDQ, with a significant improvement between T0 and T1 in the trans group in emotional symptoms, conduct problems, hyperactivity and prosocial behaviour, which were comparable to those of the control group at T1 (Tables 2 and 3).

We know that a high proportion of transgender youth experience anxiety and depression, and there is evidence in the literature on the mental health of trans children and youth whose desired identities are affirmed and supported by their families. In this sense, the family plays an essential role in improving the lives of these minors, acting as a protective factor against depression, which is why it is important to implement strategies that promote the support of families due to their impact on mental health.[24–31]

We found substantial improvement in the mean scores and percentiles in the STAI state anxiety and trait anxiety scales in the trans group after 1 year of CSHT. We also found differences at T0 compared to the control group that had improved at T1, as the differences had decreased, although not disappeared (Tables 4 and 5). We also found substantial improvement in the BDI-II scores. Before initiation of hormone therapy, all trans participants had scores corresponding to some level of depression. After 1 year of CSHT, 70% had scores in the normal range. These findings suggest that initiation of CSHT at earlier ages than recommended at present, with adequate family support in general or specifically expressed in the decision of allowing an early social transition, may be associated with better mental health outcomes in transgender children.

Our findings are consistent with those of the longitudinal study published in *Pediatrics* by Annelou de Vries in 2014.[8] The levels of anxiety, emotional distress and behavioural disturbances and depressive symptoms and the experience of gender dysphoria in transgender participants were similar or better compared to those of their cisgender peers matched for age at 1 year of CSHT. Based on this body of evidence, it is essential for paediatric providers to have updated knowledge and an unbiased attitude on this reality, the concerns regarding the future impact of these interventions and the lack of evidence on their long-term adverse effects.[32] We ought to mention the recent position statement of the Asociación Española de Pediatría (Spanish Association of Paediatrics) on the approach to gender diverse and transgender identities in children and adolescents.[33] This document does not simply adopt the depathologising perspective that is increasingly espoused by health professionals, but pushes

beyond, calling for a necessary shift in social perception, as it considers that diversity in gender identity and expression enriches humankind.

Keeping in mind that age should not be the main criterion for initiation of hormone therapy in transgender minors, we, as other authors before us, hope for the development of more flexible management protocols.[34]

Limitations of the study

Selection bias: the selected sample is a key element in any study, and use of an inadequate sampling method is one of the most frequent sources of error in designing a study, as most statistical methods in use assume that the data source is a random sample. The simplest and most appropriate way of selecting a sample is completely random selection, but under real world conditions this is nearly impossible to do. We resorted to obtaining a convenience sample of individuals that volunteered to participate. Without forgetting that the sample in our study may not be representative of the general adolescent transgender population, as many transgender adolescents do not have a supportive family and many others do not need referral to a paediatric endocrinology clinic, we do not believe that the internal validity of our study was affected by the sampling method.

Conflicts of interest

The authors have no conflicts of interest to declare.

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