



Published in final edited form as:

J Adolesc Health. 2015 October ; 57(4): 374–380. doi:10.1016/j.jadohealth.2015.04.027.

Baseline Physiologic and Psychosocial Characteristics of Transgender Youth Seeking Care for Gender Dysphoria

Johanna Olson, M.D.^{a,b,*}, Sheree M. Schragar, Ph.D., M.S.^a, Marvin Belzer, M.D.^{a,b}, Lisa K. Simons, M.D.^a, and Leslie F. Clark, Ph.D., M.P.H.^{a,b}

^aDivision of Adolescent Medicine, Children's Hospital Los Angeles, Los Angeles, California

^bUniversity of Southern California Keck School of Medicine, Los Angeles, California

Abstract

Purpose—The purpose of this study was to describe baseline characteristics of participants in a prospective observational study of transgender youth (aged 12–24 years) seeking care for gender dysphoria at a large, urban transgender youth clinic.

Methods—Eligible participants presented consecutively for care at between February 2011 and June 2013 and completed a computer-assisted survey at their initial study visit. Physiologic data were abstracted from medical charts. Data were analyzed by descriptive statistics, with limited comparisons between transmasculine and transfeminine participants.

Results—A total of 101 youth were evaluated for physiologic parameters, 96 completed surveys assessing psychosocial parameters. About half (50.5%) of the youth were assigned a male sex at birth. Baseline physiologic values were within normal ranges for assigned sex at birth. Youth recognized gender incongruence at a mean age of 8.3 years (standard deviation = 4.5), yet disclosed to their family much later (mean = 17.1; standard deviation = 4.2). Gender dysphoria was high among all participants. Thirty-five percent of the participants reported depression symptoms in the clinical range. More than half of the youth reported having thought about suicide at least once in their lifetime, and nearly a third had made at least one attempt.

Conclusions—Baseline physiologic parameters were within normal ranges for assigned sex at birth. Transgender youth are aware of the incongruence between their internal gender identity and their assigned sex at early ages. Prevalence of depression and suicidality demonstrates that youth may benefit from timely and appropriate intervention. Evaluation of these youth over time will help determine the impact of medical intervention and mental health therapy.

Keywords

Transgender; Transgender youth; Cross sex hormone therapy; Gender transition; Sex reassignment

“Transgender” is a broad term that is often used to describe individuals whose gender self-identification or expression transgresses established gender norms. Specifically, it is the state

*Address correspondence to: Johanna Olson, M.D., Division of Adolescent Medicine, Children's Hospital Los Angeles, 5000 Sunset Blvd. 4th Floor, Los Angeles, CA 90027. jolson@chla.usc.edu (J. Olson).

Conflicts of Interest: The authors have no conflicts of interest or financial disclosures to report.

of one's internal gender identity (self-identification as male, female, both or neither) not matching one's assigned sex at birth (identification by others as male or female based on natal sex) [1]. Gender dysphoria is defined as the discomfort or anxiety that arises and persists when there is discordance between assigned sex at birth and internal experience of gender that results in an impairment of function [2]. The identity and behavior of transgender individuals are often socially and medically stigmatized, resulting in an underserved population at risk for negative health outcomes [1].

Transgender youth are presenting at gender clinics for treatment related to gender dysphoria in higher numbers than previously seen [3,4]. Few providers feel educated and comfortable enough to treat transgender people [5], and even fewer feel comfortable treating transgender youth. Experiencing the wrong puberty for transgender youth leaves them vulnerable and often triggers symptoms of depression, anxiety, maladaptive coping, and suicidality [6]. Transgender youth are likely to experience societal discrimination resulting in economic marginalization, incarceration, social isolation, and physical abuse leaving them at higher risk for drug abuse, suicide, depression, violence, human immunodeficiency virus, other sexually transmitted infections, and homelessness [7,8]. A handful of studies have examined the prevalence of psychiatric morbidity experienced by transgender youth. In 2011, deVries et al. reported on 70 transgender youth eligible for medical intervention at the Amsterdam Gender Identity Clinic of The Vrije Universiteit (VU) University Medical Center. The study utilized the Child Behavioral Checklist and the Youth Self-Report to collect information at baseline before intervention. Of the participants, 44% of the sample scored in the clinically significant range on the Child Behavioral Checklist total problem scale (compared with 8%–9% Dutch adolescent norm), and 29.6% scored in the clinically significant range on the internalizing scale of the Youth Self-Report (also compared with 8%–9% Dutch adolescent norm) [9]. Studies have estimated the prevalence of suicide attempts among transgender youth to be between 25% and 32% [1,10]. A 2013 report of transgender youth presenting to the Gender Management Service at Boston Children's Hospital showed high prevalence of psychiatric morbidities including depression (58.1%), suicide attempts (9.3%), anxiety (16.3%), and self-mutilation (20.6%) [11]. In 2014, a report from British Columbia Children's Hospital Transgender Program described similar psychiatric morbidity among 84 transgender youth, including mood disorders (35%), anxiety disorder (25%), suicide attempt (12%), and psychiatric hospitalizations (12%) [3]. In 2009, the Endocrine Society published guidelines outlining the importance of treatment for transgender youth with recommendations for medical intervention. The Endocrine Society guidelines recommend using gonadotropin-releasing hormone agonists to suppress undesired puberty in early adolescence, with the addition of cross-sex hormones for masculinization or feminization as youth get older [12]. One recent study from the Netherlands points to the positive impact of a protocol incorporating puberty suppression, cross-sex hormones, and gender reassignment surgery on psychological functioning and well-being of 55 transgender individuals who began their interventions in adolescence [13]. Prospective studies about the physical and psychosocial impact of medical treatment are rare and have not fully explored the effects of the recommended treatment protocol outlined by the Endocrine Society.

The data presented in this article represent the baseline physiologic and psychosocial characteristics obtained from the first 101 participants in a large, prospective observational

study examining a population of multiethnic transgender youth seeking care related to gender dysphoria. Future articles will report on the follow-up of these youth over time.

Methods

Self-identified transgender youth between the ages of 12 and 24 years presenting consecutively for care at the Center for Transyouth Health and Development at Children's Hospital Los Angeles between February 2011 and June 2013 were screened for participation in the study. The Center for Transyouth Health and Development has been providing care for transgender youth for more than 20 years. Currently, the clinic serves more than 425 patients between the ages of 3 and 25 years. The clinic offers a range of services including mental health counseling and referrals, family and youth support groups, puberty suppression and hormonal intervention for those youth interested in a phenotypic transition, and referrals for appropriate surgical interventions.

Eligibility criteria for the study included the age between 12 and 24 years, self-identification with an internal gender identity different than the one's assigned sex at birth, presence of gender dysphoria, desire to undergo puberty suppression or phenotypic gender transition, naivety to cross-sex hormones or <3 months of previous cross-sex hormone use, and ability to read and comprehend English. Before enrollment in the study, participants underwent mental health screening by a gender specialized therapist to diagnose gender dysphoria, identify major mental health concerns and social risk factors that might interfere with gender transition, and provide a recommendation that medical intervention would benefit the participant in their transition process. Family dynamics related to the participants' gender transition and contribution to familial support during the process are also part of the mental health assessment. All the therapists that our Center collaborates with are vetted by our own internal mental health providers and are considered competent in the care and assessment of transgender youth. The two medical providers involved in the initial assessments are experienced physicians in the care of transgender youth.

At the time of enrollment, the Diagnostic and Statistical Manual of Mental Disorders (DSM IV-TR) [14] described criteria for *Gender Identity Disorder*, a diagnosis that has since been removed and replaced with *Gender Dysphoria* in the DSM 5 [2]. However, despite this recent revision for the purposes of this study, both the mental health and medical provider agreed that the participant met the DSM IV-TR criteria for a diagnosis of gender identity disorder before participation. Participants under the age of 18 years required consent from their legal guardians to participate in the study.

Demographic data and psychosocial measures were collected via computer-assisted survey at baseline after participants were screened and consented. Baseline physiological data were abstracted from the medical charts of the participants. One hundred and one participants were evaluated for physiologic parameters. Four baseline surveys were lost on a hard drive that could not be recovered; one participant enrolled in the study but never returned to complete the survey. Therefore, 96 baseline surveys assessing psychosocial parameters were available for analysis. Nine additional youth were screened but ineligible due to prior hormone use, and one otherwise eligible subject declined to participate because of concerns

about potential unintentional disclosure of their transgender status. Participants received a \$20 gift card for their time. The institutional review board at Children's Hospital Los Angeles approved this study.

Sociodemographic and gender measures

Demographics including age (years), country of birth (United States not including Puerto Rico, or another country), and ethnicity (African-American/black, Caucasian/white, Latino(a), Asian/Pacific Islander, or other) were collected in the study. Assigned sex at birth was assessed with the question “What was your assigned sex at birth” (male or female). The lexicon of gender is constantly evolving, requiring academicians, advocates, and community members who wish to practice cultural sensitivity to find words that most accurately represent cohorts in any given moment. For the purposes of this article, we will use “transmasculine” to describe those youth assigned a female sex at birth who identify somewhere along the masculine gender spectrum and “transfeminine” to describe those youth who were assigned a male sex at birth and identify along the feminine gender spectrum. Sexual orientation was assessed as heterosexual/straight, gay/lesbian, bisexual, or other. The investigators made the assumption that respondents would consider their gender identity as the referent for self-labeling of sexual orientation rather than their assigned sex at birth. For example, if a transmasculine individual reported being sexually or romantically attracted to men, they might identify as gay. Additionally, a transfeminine individual attracted to women might identify as a lesbian. Current living situation was assessed with the question “Which describes your living situation right now” (house or apartment you rent, parent's house or apartment, lover or sexual partner's house or apartment, hotel/motel, group home, halfway house/drug treatment center, homeless shelter, foster home, on the streets, in a vehicle, or in an abandoned building or squat, jail or juvenile hall, hospital medical facility, or other).

Seven questions explored gender identification, and the age at which participants disclosed their identity to family and nonfamily members. First, gender identity was examined with the question “How do you identify in regards to your internal gender identity” (male, female, gender fluid, gender queer, bigendered, gender bender, other)? Next, participants reported (in years) the ages at which they (1) realized that their gender identity was different from their assigned sex at birth; (2) disclosed their gender identity (“came out”) to their family; and (3) disclosed their gender identity (“came out”) to people other than family members. Finally, participants reported whether they were currently living as their asserted gender and the age in years that they began living as their asserted gender. In addition, gender dysphoria was measured with the 12-item Utrecht Gender Dysphoria Scale Adolescent Version [15]. Higher numbers on this scale indicate higher or more intense levels of gender dysphoria.

Physiologic measurements

At the initial visit, weight, standing height, blood pressure, and body mass index (BMI) were collected per routine clinical care. Nonfasting laboratory test values that had been obtained during routine visits were abstracted from patient charts and included the following: total cholesterol, high-density lipoprotein (HDL), triglycerides, aspartate aminotransferase, alanine aminotransferase, potassium, glucose, prolactin, free testosterone, total testosterone,

estradiol, and hemoglobin. Physiologic measurements are categorized according to transfeminine or transmasculine gender identity but are referenced according to assigned sex at birth.

Psychosocial parameters

A computer-assisted, self-administered interview survey assessed baseline demographics and psychosocial variables of interest. The 21-item Beck Depression Inventory (BDI II) [16] assessed the existence and severity of depression within the past few days ($\alpha = .93$). Scores were summed to provide a total scale score ranging from 0 to 63 and subsequently categorized into severity ranges of normal or minimal mood disturbance (0–13), mild depression (14–19), moderate depression (20–28), and severe to extreme depression (29–63). Suicidality was assessed using two binary (yes/no) questions; “Have you ever thought about killing yourself” and “Have you ever tried to kill yourself” to capture suicidal ideation and attempts.

Risk behavior

The Alcohol, Smoking and Substance Involvement Screening Test [17] was used to assess lifetime use of alcohol, tobacco, cannabis, and other illicit drugs including cocaine, sedatives, opioids, amphetamine, inhalants, hallucinogens, and “other drugs.” Use of each substance was measured with a binary (yes/ no) item; participants were considered to have used “other illicit drugs” if they reported having previously used at least one of the drugs specified by the Alcohol, Smoking and Substance Involvement Screening Test other than alcohol, tobacco, or cannabis. Sexual activity was assessed by asking the participant's age at their first sexual encounter; participants were instructed to enter “0” if they had never been sexually active. Among sexually active participants, sex work was measured with the binary (yes/no) question “Have you ever traded sexual activity or favors for food, money, a place to sleep, drugs or other material goods?”

Statistical analysis

Descriptive statistics are reported for all variables measured. Means and standard deviations (*SD*) were used to summarize continuous variables; frequencies and percentages summarize categorical variables. The demographics, gender demographics, and psychosocial parameters of transfeminine and transmasculine youth were compared using independent samples *t* tests for continuous measures, chi-square tests for categorical measures where appropriate, and Fisher's exact test for dichotomous comparisons with small cell sizes (expected value < 5 for any cell).

Results

Demographic information

One hundred and one participants were enrolled in the study. Fifty-two (51.5%) were transmasculine spectrum individuals, those participants who were assigned a female sex at birth based on female genital anatomy, and forty-nine (48.5%) were transfeminine spectrum individuals, those who had been assigned a male sex at birth based on male genital anatomy. Although youth ranged in age from 12 to 24 years (mean = 19.2, *SD* = 2.9 years), the

transfeminine youth in our sample were significantly older than the transmasculine youth ($t[94] = 2.18, p = .03$). Half of the sample (52%) reported their ethnicity as Caucasian, 26% Latino/a, 11% African-American, 2% Asian/Pacific Islander, and 7% other ethnicity, with significant racial/ethnic variation between genders as well ($\chi^2[2] = 9.45, p = .009$); transfeminine youth were equally likely to be Caucasian, Latina, or another race, whereas transmasculine youth were more likely to be Caucasian. Most participants were living with their parents (53%); 19% lived in their own or rented house or apartment; 5% lived with a family member; and the remainder (23%) were in a group home, homeless shelter, foster home, or other domicile. There were no significant differences in country of origin or living situation (Table 1).

Physiologic parameters

Physiologic parameters including blood pressure, glucose, alanine aminotransferase, and lipids were within normal clinical range for most of the participants. BMI scores ranged from 17 to 41.3 kg/m² (transfeminine youth) and 16.9 to 44.2 kg/m² (transmasculine youth). Nine transfeminine youth (18%) had a BMI between 25 and 30 kg/m²; 10 (20%) had a BMI more than 30 kg/m². Nineteen (37%) transmasculine youth had a BMI between 25 and 30 kg/m², and 11 (21.5%) had BMI more than 30 kg/m².

Baseline total testosterone levels for transmasculine youth ranged from 7 to 288 ng/dL, with a mean of 42.5 ng/dL (normal female range 2–45 ng/dL). Four participants with preexisting diagnoses of polycystic ovarian syndrome, and one with another virilizing condition, may have accounted for the higher baseline levels of total testosterone in the sample. Baseline estradiol levels in the transfeminine youth were within the normal male range for all the participants (range 2–61 pg/mL; mean 27.8 pg/mL). Transfeminine youth had prolactin levels within normal range (Tables 2 and 3).

Gender demographics

Fifty-seven percent of transfeminine youth and 94% of transmasculine youth were living in the role of their asserted gender at the initial study visit. The average age participants began living in the asserted gender role was 16.8 years ($SD = 3.9$). At the initial study visit, eighty-six (88%) of the participants had come out as transgender to their family, at an average age of 17.1 ($SD = 4.2$) years. Ten participants defined their gender outside the gender binary; gender queer (5), gender fluid (1), bi-gender (1), gender bender (2), and other (1). Transmasculine youth had a significantly higher level of gender dysphoria than transfeminine youth at baseline (55.9 vs. 50.1 respectively; $t[78] = -4.418, p < .001$). There were no other significant differences in gender demographics (Table 4).

Sexual orientation

Most transfeminine youth identified their sexual orientation as heterosexual females (59.6%); other sexual orientations included lesbian (12.8%), bisexual female (12.8%), other (12.8%), and unsure (2%). Of the transmasculine youth, just more than half (55%) identified their sexual orientation as heterosexual male. Other sexual orientations included bisexual male (10%), gay male (2%), asexual (2%), other (27%), and unsure/do not know (4%).

There were no differences between genders in the likelihood of youth of endorsing a nonheterosexual identity.

Psychosocial parameters

Twenty-four percent of participants had Beck Depression Inventory scores in the mild-to-moderate depression range, and 11% had scores indicating severe to extreme depression. Fifty-one percent of participants reported ever thinking about suicide, and 30% had attempted suicide at least once in their lives (Table 5).

Risk behavior

Most participants reported ever using alcohol, tobacco, and cannabis (75.5%, 58%, and 61.5%, respectively). Forty-three percent reported ever using other drugs, including cocaine, inhalants, hallucinogens, opioids, tranquilizers, and stimulants.

Nearly half (45%) of the participants reported being sexually active, including 55% of transfeminine youth and 37% of trans-masculine youth. Six transfeminine and three transmasculine youth reported engaging in survival sex that is trading sex for money, food, drugs, or a place to live. There were no differences between transfeminine and transmasculine youth in psychosocial parameters or risk behavior.

Hormone therapy

All participants expressed a desire to begin hormonal intervention to assist in bringing their physical bodies into better alignment with their internal gender identity. Two youth were on gonadotropin-releasing hormone agonist treatment for suppression of their endogenous puberty.

Discussion

These data represent the first examination of a large, multiethnic cohort of transgender youth in the United States seeking care for gender dysphoria. Our results demonstrating baseline physiologic data that are in line with the normal ranges of the same assigned sex nontransgender youth population help to alleviate lingering concerns that caregivers and providers might have regarding “hormone imbalance” as an explanation and possible cure for youth presenting with gender dysphoria. Of note are the high numbers of overweight and obese youth in this sample. Transgender individuals may be using increased body fat to hide undesirable physical features [18]. Future analyses on forthcoming longitudinal data will describe changes in physiologic parameters after initiation of treatment related to gender transition.

Ten participants identified their gender as “nonbinary,” reflecting a growing trend experienced clinically around the country. Addressing the medical and mental health needs of nonbinary identified youth will be an additional challenge for the community of providers caring for gender nonconforming youth.

Of interest, in this sample of youth are the higher than expected numbers with sexual orientations other than heterosexual. Although the investigators made the assumption that

participants would use their gender identity as the referent for self-labeling sexual orientation, it is possible that assigned sex at birth might have been the referent. For future work, it would be important to think about alternative responses that would more accurately reflect the sexual preferences and attractions of transgender youth. Future information and reflection on the intersection of sexuality and gender identities is warranted.

These baseline data indicate that despite improved understanding and exposure of gender nonconformity within the medical and lay community, transgender youth still have high levels of depression, suicidal thoughts and attempt rates, as well as drug and alcohol use. Twenty percent of the participants had Beck Depression Inventory scores in the moderate to extreme range. This is considerably higher than the estimated 6.7% of the general population of youth aged 12–17 years [19] and the 10.9% of young adults aged 18–24 years [20]. Suicidal thoughts and attempts reported by this sample are three and four times higher, respectively, than the prevalence for general youth reported in the Youth Risk Behavior Survey data in 2013 (54% vs. 17% thought about; 33% vs. 8% attempted) [21]. Considering that transgender youth in this sample did not disclose their authentic gender to their families until 10 years after discovery on average, it might not be surprising that many are using maladaptive coping mechanisms to manage such a profound undisclosed element of their core selves.

Although both transmasculine and transfeminine spectrum youth reported high levels of gender dysphoria, transmasculine youth reported significantly higher numbers than their transfeminine counterparts. These results mirror the results from previous Dutch cohorts [9]. Because the Utrecht Gender Dysphoria Scale does not ask identical questions of transmasculine and transfeminine spectrum youth, it is unclear if this difference is meaningful and warrants further investigation. Future studies examining the differences in experience between young transmasculine and transfeminine spectrum youth as well as nongender binary identified adolescents would be useful in the design of ideal treatment models for transgender youth.

Limitations

These data represent the first cohort of an ongoing study. Over time, variable distributions may change as a function of the wraparound services youth receive. Additionally, these data describe those who are able to access care related to gender dysphoria and desire medical intervention for gender transition. These results may not be generalizable to transgender youth who are not receiving care or to those who do not desire a phenotypic transition with cross-sex hormones. Furthermore, the current findings are not necessarily generalizable to extant literature in which recruitment procedures generate especially high-risk samples (e.g., studies of street youth). Lastly, data collected about early childhood gender nonconforming feelings or behaviors are subject to potential recall bias. Ideally, this information could be collected in a cohort of younger children currently experiencing gender nonconformity.

Transgender youth remain a very vulnerable population at high risk for many psychosocial challenges. As the medical care for these young people becomes better understood and more widely practiced, collecting longitudinal data from this cohort will assist providers in making difficult treatment decisions. Although there are guidelines and recommendations

for the treatment of transgender-identified youth with puberty suppression in early adolescence followed by appropriate hormone therapy, there remain fundamental questions about when to start puberty suppression with gonadotropin-releasing hormone analogues, when to add cross-sex hormones, and how young is too young for gender confirmation surgery.

Finally, the trajectory of gender nonconformity among peripubertal youth is still difficult to predict, creating serious concerns for providers and families about the possibility of future regret in response to more permanent aspects of hormone therapy, such as breast development and voice deepening. The data we have begun to collect are an attempt to understand the transgender youth population and follow them over time, tracking the safety and efficacy of medical intervention as well as the impact of intervention on quality of life, high-risk behaviors, suicidality, depression indices, gender dysphoria, and potential regret in response to early medical intervention. We will continue to publish our follow-up data as they are collected, and we recommend other medical centers providing this care consider collecting information and publishing about their experiences of treating transgender youth.

Acknowledgments

Funding Sources: This work was supported in part by The Saban Research Institute Clinical Research Academic Career Development Award, as well as the National Center for Research Resources and the National Center for Advancing Translational Sciences, National Institutes of Health (NIH), through Grant Award Number KL2TR000131.

References

1. Grossman AH, D'Augelli AR. Youth and life-threatening behaviors. *Suicide Life Threat Behav.* 2007; 37:527–37. [PubMed: 17967119]
2. American Psychiatric Association, American Psychiatric Association. *DSM-5 Task Force Diagnostic and statistical manual of mental disorders: DSM-5. 5th.* Washington, D.C: American Psychiatric Association; 2013.
3. Khatchadourian K, Amed S, Metzger DL. Clinical management of youth with gender dysphoria in Vancouver. *J Pediatr.* 2014; 164:906–11. [PubMed: 24315505]
4. de Vries A, Cohen-Kettenis P. Clinical management of gender dysphoria in children and adolescents: The Dutch approach. *J Homosexuality.* 2012; 59:301–20.
5. Snelgrove JW, Jasudavicius AM, Rowe BW, et al. “Completely out-at-sea” with “two-gender medicine”: A qualitative analysis of physician-side barriers to providing healthcare for transgender patients. *BMC Health Serv Res.* 2012; 12:110. [PubMed: 22559234]
6. Olson J, Forbes C, Belzer M. Treatment of the transgender adolescent. *Arch Pediatr Adolesc Med.* 2011; 165:171–6. [PubMed: 21300658]
7. Corliss H, Belzer M. An evaluation of service utilization among male to female transgender youth: Qualitative study of a clinic-based sample. *J LGBT Health Res.* 2007; 3:53–69. [PubMed: 19042910]
8. Wilson EC, Garofalo R, Harris RD, et al. Transgender female youth and sex work: HIV risk and a comparison of life factors related to engagement in sex work. *AIDS Behav.* 2009; 13:902–13. [PubMed: 19199022]
9. de Vries AL, Steensma TD, Doreleijers TA, Cohen-Kettenis PT. Puberty suppression in adolescents with gender identity disorder: A prospective follow-up study. *J Sex Med.* 2011; 8:2276–83. [PubMed: 20646177]
10. Russell ST, Joyner K. Adolescent sexual orientation and suicide risk: Evidence from a national study. *Am J Public Health.* 2001; 91:1276–81. [PubMed: 11499118]

11. Spack NP, Edwards-Leeper L, Feldman HA, et al. Children and adolescents with gender identity disorder referred to a pediatric medical center. *Pediatrics*. 2012; 129:418–25. [PubMed: 22351896]
12. Hembree WC, Cohen-Kettenis P, Delemarre-van de Waal HA, et al. Endocrine treatment of transsexual persons: An endocrine society clinical practice guideline. *J Clin Endocrinol Metab*. 2009; 94:3132–54. [PubMed: 19509099]
13. deVries A, McGuire J, Steensma T, et al. Young adult psychological outcome after puberty suppression and gender reassignment. *Pediatrics*. 2014; 134:696–704. [PubMed: 25201798]
14. American Psychiatric Association, American Psychiatric Association. Task Force on DSM-IV Diagnostic and statistical manual of mental disorders: DSM-IV-TR. 4th. Washington, DC: American Psychiatric Association; 2000.
15. de Vries A, Cohen-Kettenis PT, Delamarre-van de Waal H. Clinical management of gender dysphoria in adolescents. *Int J Transgenderism*. 2006; 9:83–94.
16. Beck AT, Steer RA, Ball R, Ranieri W. Comparison of Beck Depression Inventories -IA and -II in psychiatric outpatients. *J Pers Assess*. 1996; 67:588–97. [PubMed: 8991972]
17. WHO Assist Working Group. The alcohol, smoking and substance involvement screening test (ASSIST): Development, reliability and feasibility. *Addiction*. 2002; 97:1183–94. [PubMed: 12199834]
18. Office for Victims of Crime. Office of Justice, US Dept of Justice; 2014. Responding to transgender victims of sexual assault. Available at: <http://ovc.gov/pubs/forge/index.html> [Accessed December 11, 2014]
19. Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHS). National health and nutrition examination survey data. Hyattsville, MD: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 2007–2010. Available at: http://www.cdc.gov/mmwr/preview/mmwrhtml/su6202a1.htm?s_cid=su6202a1_w#Tab7 [Accessed February 1, 2015]
20. Centers for Disease Control and Prevention (CDC). [Accessed August 9, 2014] Behavioral risk factor surveillance system, United States. 2006 and 2008. Available at: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5938a2.htm#tab1>
21. Centers for Disease Control and Prevention (CDC). [Accessed August 9, 2014] 1991-2013 High School Youth Risk Behavior Survey data. Available at: <http://nccd.cdc.gov/youthonline/>

Implications and Contribution

Although transgender youth are known to be at high risk for depression, anxiety, and suicidality, there are no data available describing the physical and psychosocial characteristics of transgender adolescents seeking sex reassignment in the United States. This study presents baseline data describing characteristics of a youth cohort with gender dysphoria.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 1
Demographics of study sample (N = 96 participants' results available for analysis)

	Transfeminine youth, mean (SD)	Transmasculine youth, mean (SD)	Total, mean (SD)
Age*			
Range 12–24 years	19.84 (2.78)	18.59 (2.84)	19.21 (2.86)
	N (%)	N (%)	N (%)
Assigned sex at birth	Male 47 (49)	Female 49 (51)	96 (100)
Ethnicity/race**			
African-American/black	7 (15)	4 (8)	11 (12)
Caucasian	18 (38)	33 (69)	51 (53)
Latino(a)	17 (35)	8 (17)	25 (26)
Asian/Pacific Islander	1 (2)	1 (2)	2 (3)
Other	5 (10)	2 (4)	7 (7)
Country of birth			
United States except Puerto Rico	42 (86)	46 (94)	88 (90)
Other	7 (14)	3 (6)	10 (10)
Current living situation			
Rented house/apt	11 (23)	8 (17)	19 (20)
Parent's house/apt	23 (49)	29 (60)	52 (55)
Family member's house/apt	3 (6)	2 (4)	5 (5)
Lover/partner's house/apt	0 (0)	4 (8)	4 (4)
Group home	2 (4)	0 (0)	2 (2)
Homeless shelter	3 (6)	0 (0)	3 (3)
Foster home	1 (2)	1 (2)	2 (2)
Other	4 (9)	4 (8)	8 (8)

SD = standard deviation; apt = apartment.

* $p < .05$;

** $p < .01$.

Table 2
Physiological parameters—transfeminine youth n = 50

	Normal cisgender male range	Transfeminine youth, mean (SD)
Systolic BP (mm Hg)	90–132	123.08 (12.23)
Diastolic BP (mm Hg)	60–83	71.50 (8.85)
Weight (kg)	—	162.26 (45.79)
Height (cm)	—	67.56 (3.44)
BMI (kg/m ²)	—	24.95 (5.79)
Total cholesterol (mg/dL)	65–175	162.88 (34.03)
HDL (mg/dL)	35–70	45.58 (10.83)
Triglycerides (mg/dL)	40–160	125.33 (83.82)
ALT (U/L)	3–35	30.98 (17.51)
Potassium (mEq/L)	3.6–5	4.22 (.34)
Glucose (mg/dL)	60–115	87.74 (12.44)
Hemoglobin (g/dL)	13–16	15.38 (1.02)
Testosterone free (pg/ml)	35–155	99.28 (102.55)
Testosterone total (ng/dl)	250–1,100	468.52 (209.48)
Estradiol (pg/ml)	<29	27.75 (12.55)
Prolactin (ng/ml)	2–18	7.94 (4.01)

ALT = alanine aminotransferase; BMI = body mass index; BP = blood pressure; HDL = high-density lipoprotein; SD = standard deviation.

Table 3
Physiological parameters—transmasculine youth n = 51

	Normal cisgender female range	Transmasculine youth, mean (SD)
Systolic BP (mm Hg)	90–132	115.86 (13.83)
Diastolic BP (mm Hg)	60–83	66.16 (10.96)
Weight (kg)	—	159.06 (39.55)
Height (cm)	—	64.71 (2.46)
BMI (kg/m ²)	—	26.54 (5.76)
Total cholesterol (mg/dL)	65–175	166.06 (33.03)
HDL (mg/dL)	35–70	51.26 (11.25)
Triglycerides (mg/dL)	35–135	103.60 (79.14)
ALT (U/L)	3–35	22.60 (9.97)
Potassium (mEq/L)	3.6–5.0	4.24 (.34)
Glucose (mg/dL)	60–115	88.43 (15.06)
Hemoglobin (g/dL)	12–15.5	13.21 (.98)
Testosterone free (pg/ml)	.5–3.9	7.00 (10.45)
Testosterone total (ng/dl)	<41	42.53 (41.21)
Estradiol (pg/ml)	39–440	83.51 (86.63)

ALT = alanine aminotransferase; BMI = body mass index; BP = blood pressure; HDL = high-density lipoprotein; SD = standard deviation.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 4
Gender demographics

	Transfeminine youth, N (%)	Transmasculine youth, N (%)	Total N (%)
Living as asserted gender			
Yes	26 (57)	45 (94)	71 (76)
	Mean (SD)	Mean (SD)	Mean (SD)
<hr/>			
Age, realized gender different from assigned (years)			
Range 2–22	8.42 (4.72)	8.17 (4.35)	8.29 (4.52)
Age, coming out to family (years)			
Range 3–23	17.93 (3.51)	16.60 (4.16)	17.26 (3.89)
Age, coming out to others (years)			
Range 7–24	17.24 (3.45)	16.73 (3.55)	16.99 (3.49)
Age, living as asserted gender (years)			
Range 2–23	16.57 (4.73)	16.59 (4.16)	16.58 (4.35)
Utrecht Gender Dysphoria Scale *			
Range 23–60	50.06 (7.91)	55.86 (4.69)	52.96 (7.09)
<hr/>			
	Transfeminine youth, N (%)	Transmasculine youth, N (%)	Total N (%)
<hr/>			
Gender identity			
Male	0	44 (90)	44 (45)
Female	44 (90)	0	44 (45)
Gender queer	2 (4.3)	3 (6.1)	5 (5)
Bigender	0	1 (2)	1 (1)
Gender bender	1 (2)	1 (2)	2 (2)
Gender fluid	0	1 (2)	1 (1)
Other	1 (2)	0	1 (1)
Sexual orientation			
Heterosexual/straight female	28 (60)	0	28 (29)
Heterosexual/straight male	0	27 (57)	27 (28)
Lesbian female	6 (12.8)	0	6 (6.2)
Gay male	0	1 (2)	1 (1)
Bisexual	6 (13)	5 (11)	11 (12)
Asexual	0	1 (2)	1 (1)
Unsure/undecided	1 (2)	2 (4)	3 (3)
Other	6 (12.8)	13 (26.5)	19 (19.8)

Eleven participants did not report coming out to family; five did not report coming out to others.

* $p < .001$.

Table 5
Psychosocial parameters and risk behavior

	Transfeminine youth, N (%)	Transmasculine youth, N (%)	Total, N (%)
Depression			
Normal or minimal mood disturbance: BDI 0–13	31 (66)	28 (64)	59 (65)
Mild depression: BDI 14–19	5 (11)	9 (21)	14 (15)
Moderate depression: BDI 20–28	5 (11)	3 (7)	8 (9)
Severe to extreme depression: BDI 29–63	6 (13)	4 (9)	10 (11)
Thought about suicide (ever)			
Yes	20 (43)	29 (60)	49 (51)
Attempted suicide (ever)			
Yes	13 (27)	16 (33)	29 (30)
Substance use (ever)			
Alcohol	37 (79)	34 (72)	71 (76)
Tobacco	24 (51)	31 (65)	55 (58)
Cannabis	30 (63)	29 (60)	59 (62)
Other illicit drugs	19 (40)	22 (46)	41 (43)
Initiated sexual activity			
Yes	27 (55)	18 (37)	45 (46)
Sex work (ever)			
Yes	6 (12; 22 of sexually active)	3 (6; 17 of sexually active)	9 (9; 20 of sexually active)

BDI = Beck Depression Inventory.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript