

Adolescents With Gender Identity Disorder Who Were Accepted or Rejected for Sex Reassignment Surgery: A Prospective Follow-up Study

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ABSTRACT

Objective: To conduct a prospective follow-up study with 20 treated adolescent transsexuals to evaluate early sex reassignment, and with 21 nontreated and 6 delayed-treatment adolescents to evaluate the decisions not to allow them to start sex reassignment at all or at an early age. **Method:** Subjects were tested on their psychological, social, and sexual functioning. Follow-up interviews were conducted from March 1995 until July 1999. Treated patients had undergone surgery 1 to 4 years before follow-up; nontreated patients were tested 1 to 7 years after application. Within the treated and the nontreated group, pre- and posttreatment data were compared. Results between the groups were also compared. **Results:** Postoperatively the treated group was no longer gender-dysphoric and was psychologically and socially functioning quite well. Nobody expressed regrets concerning the decision to undergo sex reassignment. Without sex reassignment, the nontreated group showed some improvement, but they also showed a more dysfunctional psychological profile. **Conclusions:** Careful diagnosis and strict criteria are necessary and sufficient to justify hormone treatment in adolescent transsexuals. Even though some of the nontreated patients may actually have gender identity disorder, the high levels of psychopathology found in this group justify the decision to not start hormone treatment too soon or too easily. *J. Am. Acad. Child Adolesc. Psychiatry*, 2001, 40(4):472–481. **Key Words:** gender identity disorder, transsexualism, sex reassignment surgery, adolescents.

Despite the early onset of gender identity disorder (GID) in many transsexuals, and in spite of the fact that transsexuals apply for sex reassignment surgery (SRS) at increasingly younger ages, it is common practice not to start the actual sex reassignment (SR) procedure before the age of 18 or 21 years. One of the main objections of professionals against a start of the SR procedure before 18 years is the risk of postoperative regrets. One fears that, as a consequence of the developmental phase itself, adolescents will not be capable of making a sensible decision

about something as drastic as SR. Moreover, medical interventions in adolescence are expected to lead to unfavorable results concerning the physical, psychological, and social functioning of the adolescent. Despite these hesitations, transsexual adolescents have been diagnosed and referred for hormone treatment and SRS at the gender clinic of the Department of Child and Adolescent Psychiatry of University Medical Center Utrecht (UMCU). In those carefully selected patients who are referred for hormone treatment, the often-assumed association between transsexualism and psychopathology has not been found (Cohen et al., 1997; Cohen-Kettenis and van Goozen, 1997). This significantly contributed to the decision to start hormone therapy between the ages of 16 and 18 in two phases: first, hormones with reversible effects (for male-to-females [MFs], antiandrogens to block further masculinization of the body; for female-to-males [FMs], progestins to suppress menstruation); second, estrogens to feminize the MFs and androgens to masculinize the FMs. Although postoperative regret or any other unfavorable result is a matter of serious concern for our

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clinicians, it is also considered important to avoid lifelong suffering due to postponement of treatment. With early SR two major negative consequences of late treatment may be prevented: (1) irreversible physical changes (especially a low voice and beard growth in MFs), which may create lifelong traces of the biological sex; and (2) delay or arrest in areas that are particularly important during adolescence (e.g., peer relationships, romantic involvements, or academic achievement), which may lead to additional, yet avoidable problems. Thus early treatment may be particularly suitable to prevent unnecessary psychological and emotional problems.

Furthermore, on the basis of numerous follow-up studies it can be concluded that in adults, unfavorable postoperative outcome is related to a late start of the SR procedure rather than an early one (for a review, see Cohen-Kettenis and Gooren, 1999). Age at assessment also emerged as a factor differentiating two small groups of adult MF transsexuals with and without postoperative regrets (Lindemalm et al., 1987).

Naturally, if a resolution to extreme and lifelong cross-gender identity problems is attainable with less invasive treatment methods, clinicians should refrain from SRS, in adolescents as well as in older patients. However, as more extensively discussed by Cohen-Kettenis and van Goozen (1997), the literature does not provide convincing evidence that psychotherapy can alter a fixed cross-gender identity (Cohen-Kettenis and Kuiper, 1984).

Cohen-Kettenis and van Goozen (1997) conducted a retrospective study on postoperative functioning of the first 22 consecutive adolescent transsexual patients who had attended our gender clinic and who had undergone SRS. They concluded that starting the SR procedure before adulthood results in positive postoperative functioning, provided that careful diagnosis takes place in a specialized gender team and that the criteria for starting the procedure early are strict (see Cohen-Kettenis and van Goozen, 1997, for details concerning the clinical approach).

To confirm these initial results, a prospective follow-up study was conducted with the next 20 consecutive adolescents who had undergone SRS. This time, we also investigated what had become of the adolescents whose application for SR had been rejected or who had refrained from SR in the first diagnostic phase. Inasmuch as we expected applicants to be heterogeneous with respect to gender dysphoria, comorbidity, and perhaps other factors, this study should be seen as an evaluation of two related but separate clinical decisions. The first and most impor-

tant one was whether it had been a correct decision to allow well-functioning adolescent transsexuals to proceed with the SR procedure after careful screening, given that they were between 16 and 18 years of age. The second one was to find out whether the decision not to allow other adolescent applicants to proceed with the SR procedure before age 18 had been a justified one.

This study focuses primarily on postoperative gender dysphoria, feelings of regret, gender role behavior, and an evaluation of the treatment, but other areas such as psychological, social, and sexual functioning were also addressed. The same domains were investigated in the treated and nontreated groups.

METHOD

SUBJECTS

The 20 patients (13 FMs, and 7 MFs), who consecutively underwent SRS after the 22 patients of the first study, were invited to participate at least 1 year after their last surgical treatment. All treated (T) patients responded positively and were included. While applying for SR in their first diagnostic phase, 21 other applicants withdrew their request for SR, were rejected, or did not show up for appointments. The primary reason for rejection or withdrawal was that they were not diagnosed transsexuals despite the fact that some did have gender identity problems. In many of these cases the psychological or environmental problems were too serious to make an accurate diagnosis. In other cases, when patients did not show up for appointments, a diagnosis had not yet been made before we lost contact. Hence, the rejected/withdrawn cases did not start hormone treatment and the real-life experience phase (this group we call hereafter the NT group). Another six eventually started hormone treatment. Two started after an initial delay when still in contact with our gender clinic; four were expected to belong to the NT group when contacted but appeared to have reapplied at another gender clinic where adults are treated.

Four individuals of the NT group were not traceable and could therefore not be included in the analyses. Some of their data, gathered at the time of their application, were used descriptively. Three others could not be interviewed, but some follow-up data were collected through their parents. Finally, our clinic was contacted by psychiatric institutions requesting information about two of our (nontraceable) patients, which provided us with information about their current status. This resulted in a T group of 7 MFs and 13 FMs, an NT group of 13 males and 8 females, and a delayed-treatment (DT) group of 4 MFs and 2 FMs. Statistical analyses of the NT group were based on 9 males and 5 females, who were seen both at the time of application and at follow-up. All applicants were between 13 and 18 years old at the time of first assessment. Data concerning the DT group were not included in the statistical analyses. (See Table 1 for additional information about the DT and NT groups.)

INSTRUMENTS

Intelligence

The most recently adapted Dutch versions of the Wechsler scales, which are the WISC-R (van Haasen et al., 1986) and the WAIS (Stinissen et al., 1970), were used to measure IQ.

TABLE 1
Additional Descriptive Information About the Nontreated Group and the Delayed-Treatment Group

No.	Status End Diagnostic Phase	TS Diagnosis	Delayed Treatment	Source Follow-up Info	Comorbidity Pretest	Comorbidity Posttest ^e	Additional Information
1.	Extended 1st diagnostic phase	Deferred TS diagnosis	Yes	Interview	—	—	—
2.	Extended 1st diagnostic phase	TS	Yes	Only pretest data ^b	—	—	Orphan; many foster homes at application
3.	Referred for psychotherapy	No TS	Yes	Interview	ODD	—	Recent sexual abuse at application
4.	Withdrawn	Deferred diagnosis	Yes	Interview	Dysthymia	Psychotic episodes	Father with psychiatric disorder (depression)
5.	Withdrawn by others	TS	Yes	Interview	ODD	—	IQ: 65; institution for mentally disabled at follow-up
6.	Referred for psychotherapy	Deferred TS diagnosis	Yes	Interview	Stuttering	—	Severe family problems
7.	Withdrawn	TS	No	Interview	Depression; anorexia; suicidal aut mutilation	—	Very religious
8.	No show	No TS	No	Parent ^c	Schizophrenia	Schizophrenia	Suicide
9.	Withdrawn	No TS	No	Parent ^c	—	—	Deaf; homosexual
10.	Withdrawn	No TS	No	Interview	—	—	Mentally retarded
11.	Withdrawn	No TS	No	Parent ^c	—	Schizophrenia	Psychiatric clinic at follow-up
12.	Second opinion	No TS	No	Only pretest data ^b	Depression	—	Very religious; ego-dystonic homosexual
13.	No show	Deferred TS diagnosis	No	Interview	?	—	Neglected and sexually abused; orphan; homeless
14.	Rejected	No TS	No	Interview	Pathological gambling	—	School dropout
15.	No show	No TS	No	Interview	—	—	School problems
16.	No show	Unclear	No	Psychiatric institutions ^d	ODD	ODD	Psychiatric and forensic institutions
17.	Withdrawn	No TS	No	Interview	Gender identity disorder	—	Congenital heart defect; mother died early
18.	No show	No TS	No	Interview	Schizophrenia [?]	—	Schizophrenic mother
19.	Withdrawn	No TS	No	Interview	—	—	Homosexual
20.	Withdrawn	No TS	No	Only pretest data ^b	Borderline personality disorder	—	Lesbian; alcoholic father
21.	No show	No TS	No	Psychiatric institutions ^d	PDD	—	Alcoholic parents; mother died of alcohol-related problems; special institutions
22.	Referred to autism team	No TS	No	Interview	PDD	PDD	—
23.	Second opinion	No TS	No	Interview	Asperger's syndrome	—	Homosexual
24.	Withdrawn	No TS	No	Interview	?	—	—
25.	Withdrawn	No TS	No	Interview	?	—	Lesbian; sadomasochistic preference
26.	Withdrawn	No TS	No	Interview	PDD NOS	—	—
27.	Withdrawn	No TS	No	Interview	—	—	—

Note: TS = transsexual; ODD = oppositional defiant disorder; PDD = pervasive developmental disorder; NOS = not otherwise specified.

^a Confirmed diagnosis by psychiatrist at posttest. Dash means subject was not psychiatrically evaluated at posttest, at least not to our knowledge; this does not automatically imply an absence of psychiatric problems.

^b Source follow-up data gathered through first diagnostic procedure.

^c Source follow-up data gathered through telephone interview with parent of subject.

^d Source follow-up data gathered through psychiatric institutions that requested information about subject.

^e Probably a DSM-IV diagnosis, but not enough time to confirm a diagnosis.

Gender Dysphoria

Gender dysphoria was measured with the Utrecht Gender Dysphoria Scale (UGS), consisting of 12 items on which the subject rated his/her agreement on a 5-point scale. The higher the score, the more gender dysphoria was indicated (for psychometric data, see Cohen-Kettenis and van Goozen, 1997).

Body Dissatisfaction/Physical Appearance

Body Image Scale. A body image scale (BIS) (Lindgren and Pauly, 1975) which had been adapted for a Dutch sample (Kuiper, 1991) was used. A higher score indicates more dissatisfaction.

Appraisal of Appearance Inventory. On the 14-item Appraisal of Appearance Inventory (AAI), three independent observers (the diagnostician, a nurse from the gender team, and the researcher) rated their subjective appraisal of the appearance of the subject on a 5-point scale of femininity/masculinity; higher scores indicate more incompatibility of the appearance with the new gender.

Psychological Functioning

Psychological functioning was assessed with the Dutch Short MMPI (NVM) (Luteyn et al., 1980) and the Dutch version of the Symptom Checklist 90 (SCL-90) (Derogatis et al., 1973; Dutch version: Arrindell and Ettema, 1986).

Treatment Evaluation and Posttreatment Functioning

Treatment Satisfaction. T patients completed a semistructured interview about treatment outcome, experiences during and after SR, treatment evaluation, and feelings of regret. NT patients were asked questions regarding their way of living and level of functioning after refraining from or delaying SR. When applicable, questions from the T patients' interview were adapted.

Social and Sexual Functioning. In a semistructured interview, questions were asked about the subjects' current life situation (Doorn et al., 1996). Specific questions about sexual contact after surgery were omitted for the NT group. Results were analyzed per item.

Satisfaction With Surgery. T patients completed a self-developed questionnaire concerning functionality of the vagina or penis and satisfaction with surgical results (Cohen-Kettenis and van Goozen, 1997). Results were analyzed per item.

Public Confrontation Questionnaire. A questionnaire assessed reactions of the social environment and was used to evaluate the subject's experiences of being able to "pass" in the new social role (Doorn et al., 1996). Results were analyzed per item.

Quality of Life. The Affect Balance Scale (Bradburn, 1969) was used in the T and NT groups to measure overall psychological well-being. The scale consists of five positive and five negative items. Only the negative affect scores were analyzed because in a randomly selected sample the Cronbach α for the positive affect scale was found to be too low (positive affect scale, .59; negative affect scale, .73) (Kempen and Ormel, 1992). The adapted Dutch version of the scale by the Central Bureau of Statistics (1987) was used.

Various questions were analyzed per item because they did not form a scale. Whenever this was the case we have indicated in the "Results" section how many response categories they contained.

PROCEDURE

IQ was assessed before treatment. The UGS, the BIS, the AAI, and the Personality Questionnaires were administered before and after treatment because within-subject changes were expected. The

remaining instruments concerned the postoperative situation and were only administered after treatment. Instruments pertaining to posttreatment functioning were not administered to the NT group.

T patients came to UMCU or combined a hormone checkup at Free University Hospital in Amsterdam (FUHA) with the interview and testing. Each session took 2 to 3 hours. To avoid socially desirable responses the subjects were seen by the first author, who had not been involved in their diagnosis or treatment. The Ethics Committees of UMCU and FUHA approved the study.

STATISTICAL ANALYSES

Changes over time within the T and the NT group were analyzed with univariate paired t tests. Differences between groups were analyzed with univariate independent t tests. Subjects with a score more than 2.5 SD above the mean score of their subgroup were considered to be outliers. Their values were replaced by the mean value of their subgroup.

RESULTS

Demographics

The mean age of the T group was 16.6 years (range 15–19) at pretest and 21.0 (range 19–23) at follow-up. Ten T patients had started hormone treatment between 16 and 18 years of age. The average time elapsed between the last operation and the time of the follow-up interview was 1.3 years (range 1–4). The group's pretreatment mean IQ score was 107 (SD = 16; range 85–140). At follow-up nine subjects (48%) were students (at a school for business administration or a university), five had jobs, and five were unemployed. Ten subjects lived independently or in student dormitories, one lived with her partner, and eight were living with one or both of their parents.

The mean age of the NT group was 17.3 years (range 13.7–20.2) at pretest and 21.6 (range 15.7–26.2) at follow-up. The average time elapsed between SR application and the time of the follow-up interview was 4.2 years (range 1–7). The group's mean IQ score was 104 (SD = 15; range 89–130) at pretest. At follow-up six were students, five had jobs, and four were unemployed. Six subjects of the NT group lived independently, one lived with a partner, and seven lived with one or both of their parents. Another subject lived in a psychiatric institution.

Gender Dysphoria

The T group reported less gender dysphoria ($p < .001$) at follow-up than at pretest (Table 2). The mean pretest and posttest scores of this group were completely in the range of those from the previous study (pretest mean = 51.7, SD = 6.3; posttest mean = 14.8, SD = 3.2). None of the subjects expressed feelings of regret about their SR (3-point scale).

TABLE 2
Pretest and Posttest Scores of the Treated (T) Group ($n = 20$) and the Nontreated (NT) Group ($n = 14$)

	Pretest		Posttest		Paired t	Two-Tailed p
	Mean	SD	Mean	SD		
Gender dysphoria: UGS						
T	56.3	4.6	13.8	2.3	-38.48	<.001
NT	46.7	13.9	31.1 ^a	14.9	-5.13	.002
Body dissatisfaction: BIS						
Primary sex characteristics						
T	17.9	3.0	10.2	5.7	-5.84	<.001
NT	16.1	5.1	13.4	4.9	-2.55	.04
Secondary sex characteristics						
T	32.0	6.0	24.9	6.9	-4.03	.001
NT	29.6	5.3	27.6	5.9	-1.53	.18
Other body characteristics						
T	40.1	6.9	35.2	8.6	-3.06	.007
NT	41.6	4.2	36.4	8.1	-2.15	.08
Psychological functioning: NVM						
Negativism						
T	21.8 ²	6.9	20.5 ²	7.9	-0.61	.55
NT	22.9 ²	5.7	26.4 ⁴	6.9	1.09	.31
Somatization						
T	8.2 ²	6.2	7.7 ²	8.3	-0.20	.84
NT	7.8 ²	6.9	10.1 ⁴	9.0	0.60	.56
Shyness						
T	13.1 ²	6.8	11.8 ²	8.0	-0.69	.50
NT	12.1 ²	8.5	12.3 ²	6.5	0.15	.89
Psychopathology						
T	2.9 ²	2.6	2.8 ²	2.0	-0.15	.88
NT	6.3 ^{4b}	4.7	6.1 ⁴	4.0	-0.15	.88
Extraversion						
T	16.7 ²	6.7	16.8 ²	6.7	0.04	.97
NT	15.9 ¹	3.6	15.2 ¹	5.1	-0.34	.74
Psychological functioning: SCL-90						
Psychoneuroticism						
T	145 ⁴	35.6	129 ³	45.4	-1.20	.24
NT	159 ⁴	78.0	163 ^{4b}	50.9	0.18	.86
Anxiety						
T	15.8 ⁴	5.4	12.8 ³	3.8	-2.07	.05
NT	19.5 ⁴	11.4	18.2 ^{4b}	6.4	-0.38	.71
Agoraphobia						
T	9.1 ⁴	2.2	8.1 ⁴	1.3	-1.88	.08
NT	9.0 ⁴	1.9	9.4 ⁴	3.4	0.33	.75
Depression						
T	28.3 ⁴	9.8	21.6 ³	3.7	-2.77	.01
NT	31.8 ⁴	15.6	35.2 ^{5b}	14.7	0.50	.63
Somatization						
T	16.1 ³	3.6	14.8 ²	3.9	-1.22	.24
NT	19.9 ⁴	10.3	17.6 ³	5.1	-0.64	.54
Inadequacy						
T	15.2 ³	4.9	13.9 ³	5.4	-1.0	.33
NT	15.1 ³	4.2	18.9 ⁴	6.9	1.64	.14
Sensitivity						
T	28.3 ⁴	8.8	24.7 ³	6.9	-1.44	.17
NT	25.6 ³	10.2	27.8 ⁴	7.5	0.55	.59
Hostility						
T	9.7 ⁴	3.1	7.9 ⁴	2.2	-2.34	.03
NT	10.0 ⁴	4.9	8.5 ⁴	2.6	-1.06	.32
Sleeping problems						
T	6.2 ⁴	3.8	5.3 ³	3.3	-0.98	.34
NT	5.7 ⁴	2.6	5.9 ⁴	3.0	0.23	.83

Note: Dutch norm scores for mean scores on subscales of NVM and SCL-90 are represented by superscript numbers: 1 = below average; 2 = average; 3 = above average; 4 = high; 5 = very high. Independent t test: ^a $p = .001$; ^b $p < .05$. UGS = Utrecht Gender Dysphoria Scale; BIS = body image scale; NVM = Dutch Short MMPI; SCL-90 = Symptom Checklist 90.

The NT group was also less gender-dysphoric ($p = .002$) at follow-up than at the time of application. However, the decrease in gender dysphoria was much greater within the T than within the NT group ($p = .002$).

Eleven subjects of the NT group did not feel any regrets about having refrained from SR or being rejected (three response categories). One woman slightly regretted having refrained from SR because she still had doubts about her gender identity. Two men also slightly regretted the decision not to start treatment, but in both, the wish for SR was not clearly differentiated from unrealistic expectations that SR would resolve important nongender problems. Finally, one man who strongly regretted not having started SR wanted only a breast enlargement and no vaginoplasty.

Body Dissatisfaction

With respect to their overall appearance, the majority of the T group reported satisfaction: 16 subjects were satisfied or very satisfied, 1 was very dissatisfied, and 2 were neutral (Table 2). Satisfaction with primary and secondary sexual characteristics significantly increased after treatment. Also, the group's mean score on the AAI was lower ($p < .001$) at posttest, indicating that, according to observers, their appearance had become more compatible with the new gender.

Of the NT group, six subjects were (very) dissatisfied with their overall appearance. Five subjects reported being (very) satisfied, while three subjects expressed a neutral view. Over time the NT group had become more satisfied with their primary sex characteristics, although there was no change in satisfaction with the secondary sex characteristics.

Psychological Functioning

Analysis of the NVM of the T group showed no significant changes after treatment (Table 2). When pre- and posttest group means were compared with Dutch normative data, all scores were within the average range, indicating normal functioning. The mean T group's total score on the SCL-90 (Psychoneuroticism) was not significantly lower at posttest than at pretest, although compared with Dutch normative data this score fell in the high range at pretest and in the above-average range at posttest. The mean scores on the subscales Anxiety, Depression, and Hostility were lower at posttest.

The NVM results of the NT group showed a more dysfunctional profile. When compared with a Dutch norma-

tive group, the subscale Psychopathology was in the high range at pre- and posttest. The results on the SCL-90 were also unfavorable. The total score was and remained in the high range, compared with normative groups. Here it is important to keep in mind that probably the patients who functioned worst had not completed the tests at follow-up because they were psychiatrically hospitalized.

Treatment Evaluation and Posttreatment Functioning of the Treated Group

Satisfaction With Surgery. Breast removal is emotionally the most important type of surgery for adolescent FMs because they are advised to postpone metaidoioplasty (transformation of the hypertrophic clitoris into a micro-penis) or phalloplasty because the surgical techniques are steadily improving. Only one FM had undergone phalloplasty and two FMs had a neoscrotum. For the MFs vaginoplasty (including amputation of the penis) is the most important surgical intervention.

Eight FMs were satisfied with their breast removal, whereas five were dissatisfied with the result because of the visibility of the scars. Nevertheless, nine did not have any problems baring their chest when swimming.

Three MFs expressed satisfaction with their vaginoplasty: they felt their vaginas looked natural. Another three individuals were not completely satisfied, mostly because they considered their vagina not deep or feminine enough. Two were disappointed that they could not achieve orgasms. Five MFs had experienced sexual intercourse without problems. One MF had attempted intercourse but had a vaginistic response.

Relationships and Sexuality. Ten subjects had a stable relationship with one partner at the time of the interview and 9 had no partner at follow-up or had never had one. Of the 10 subjects who had a steady sexual partner, 7 expressed satisfaction with their sex life, 2 expressed a neutral view, and 1 FM was dissatisfied (five response categories). This FM was unhappy about the fact that he could not have intercourse with a "normal" penis with his girlfriend, but said he was very happy with the relationship itself. He also reported achieving orgasm every time they had intercourse after his metaidoioplasty.

Several FMs reported that they found it difficult to live without a penis, especially at moments when they did not know their potential sexual partner well. Masturbation was not very frequent (five response categories). MFs reported a decrease in masturbation frequency after treatment (three response categories), and FMs reported an

increase or no change. Of the 16 individuals who were sexually active, with or without partner, 11 achieved orgasms regularly (five response categories).

Eighteen subjects had a compatible sexual orientation (that is, MFs feeling attracted to heterosexual men or homosexual women, and FMs to heterosexual women or homosexual men), whereas one person was not (yet) sure about her sexual orientation.

Social Life and Social Contacts. The majority of the T group (16 subjects) felt accepted and supported in their new gender role by everyone they knew, whereas 3 felt accepted and supported by most people (four response categories). Sixteen participants had not lost any family member or friend or had lost contact with one person only. Two subjects had lost more than one friend as a consequence of the SR. Twelve persons indicated that they were (very) satisfied with their social contacts with the opposite gender and 13 individuals were (very) satisfied with their same-gender social contacts; 2 subjects were dissatisfied about their contacts with the opposite gender (five response categories). Most people (15 subjects) did not feel lonely, 2 felt lonely sometimes, and another 2 felt quite lonely sometimes (five response categories).

Superficial contacts such as those with neighbors or shopkeepers were either nonexistent/neutral (6 persons) or positive (13 persons). None of the subjects had experiences of actually being harassed. One MF subject had a few times been approached by strangers as a man since the start of her treatment, but none of the others had been approached as someone of their biological sex since the start of treatment. This corresponds with the increase in AAI ($p < .001$) at follow-up, indicating a more compatible appearance.

Quality of Life. The group reported a reasonable sense of well-being. Although not quite comparable, it is worth noting that the negative affect score of this adolescent group (mean = 4.4, SD = 3.2; range 0–10) was lower than that of the randomly selected elderly sample (mean = 6.1, SD = 1.4; range 5–10). Unfortunately, no data from a younger comparison group are available.

Self-Reported Functioning of the Nontreated Group at Follow-up

Relationships and Sexuality. Six persons had a stable relationship with a partner at the time of the interview, as opposed to nine who had no partner at follow-up or had never had one. Five subjects reported not knowing what their sexual orientation was, while another five had an incompatible sexual orientation (meaning that the males felt attracted to homosexual women and/or heterosexual

men, and the females to homosexual men and/or heterosexual women). Four subjects had a compatible sexual orientation.

Social Life and Social Contacts. Twelve persons reported feeling (very) satisfied about their social contacts with the opposite gender, whereas one person reported being very dissatisfied (five response categories). Where same-gender social contacts were concerned, nine felt (very) satisfied and three felt neutral. Six (40%) individuals did not feel lonely, another six (40%) felt lonely sometimes, and three (20%) felt lonely quite often (five response categories).

Quality of Life. The NT group's mean negative affect score (mean = 6.2, SD = 2.6; range 0–10) was not different from the mean score of the T group (mean = 4.4, SD = 3.2; range 0–10) at follow-up. They had, however, almost exactly the same score as the elderly group (6.1 and 6.2).

Functioning of the Delayed-Treatment Group

The small number of DT individuals ($n = 6$) and the difference in size compared with the T group ($n = 20$) made adequate statistical analyses not possible. Nevertheless, most mean DT group scores on the tests measuring psychological functioning were higher than the mean T group scores. At pretest the DT group scored higher than the T group on four of the five NVM scales (Negativism: mean = 29.8, SD = 6.0; Somatization: mean = 14.3, SD = 10.3; Shyness: mean = 23.3, SD = 3.2; Psychopathology: mean = 9.3, SD = 4.0) and on six (Anxiety, Agoraphobia, Depression, Inadequacy, Sensitivity, Hostility) of the eight SCL-90 subscales, creating a higher total mean score on Psychoneuroticism (mean = 212, SD = 75.5). At posttest the mean DT scores on the UGS (mean = 39.8, SD = 6.0), the primary BIS (mean = 19.6, SD = 0.55), the NVM Shyness (mean = 17.4, SD = 10.2), and NVM Psychopathology scale (mean = 9.0, SD = 8.0), and the same six SCL-90 subscales and its total score (mean = 182, SD = 88.6), were higher than the mean T group scores. In sum, the DT group was psychologically functioning more poorly than was the T group at pre- and posttest. At posttest the DT group also showed more gender dysphoria and more body dissatisfaction. However, it is worth remembering that four of the six persons were approached before they had completed the SRS because they were expected to belong to the NT group.

DISCUSSION

As for the T sample, our results were very similar to the results of the earlier retrospective study (Cohen-Kettenis

and van Goozen, 1997). The groups were comparable with respect to various background variables and in both groups gender dysphoria had disappeared after treatment. This, of course, is the main goal of SR. Postoperatively the adolescents were also more satisfied with their primary and secondary sexual characteristics than at pretest and they functioned socially and psychologically quite well. Just as in the first study, the adolescents scored in the normal range with respect to psychological functioning. Above all, no one expressed feelings of regret concerning the decision to undergo SRS. Thus, 1 to 5 years after surgery, SR does seem to have been therapeutic and beneficial. Compared with 141 adult Dutch transsexuals, the adolescents seemed to fare better (Kuiper and Cohen-Kettenis, 1988). The findings of the adult transsexuals are most likely to be caused by their late treatment because they belonged to the first treated group in the Netherlands, and many of them had to wait until they were in their 50s, or even longer, before SRS became available. As a consequence they had more social and psychological problems and they received much less support from their environment than the adolescents did (Cohen-Kettenis and Kuiper, 1988). Another reason for their less favorable outcome is that criteria for (overall functioning of) adolescent applicants are stricter than they are for adults (see below).

Because in many adolescent transsexuals hormone treatment had started before they reached the last pubertal phases, they rather easily passed in their new role. This may also partly explain why they function better than the adults did. The fact that three observers independently evaluated the adolescents' appearance in accordance with their new gender role supports the impression of the first study and corroborates the adolescents' satisfaction with their appearance. Another aspect of this positive outcome may be attributable to the strict criteria for treatment eligibility. Compared with adults, adolescents who start treatment before age 18 have additional criteria for treatment eligibility. As a consequence, those patients selected for early treatment are among the best-functioning transsexuals. Finally, most of the transsexuals in our study were FMs and we know from other studies that postoperatively, FMs fare in many respects better than MFs (Pfäfflin and Junge, 1992). Thus we can conclude that careful diagnosis and strict criteria are necessary and sufficient to justify hormone treatment (and thereby a start of SR) in well-functioning adolescents, even if they are younger than 18.

A second aim of the study was to examine whether the decision not to proceed with the SR procedure for some

applicants had been a sensible one. For the large majority of the NT patients SRS was contraindicated. Most of the NT subjects who were still in contact with the team when this decision came about agreed. The data clearly support the decision not to allow the NT group to start SR. Our questionnaire data, which may be biased to the positive side (see above), showed that the NT subjects functioned worse than the T subjects. More than half of the NT group had been given a psychiatric diagnosis at application and/or follow-up. One subject had such a difficult time coping with his psychiatric problems that he had been hospitalized a number of times and committed suicide around the time of the follow-up interview. Not to allow these patients to start medical treatment seems to have been good decision. It is of interest that the majority of the NT group had found other ways of dealing with their gender problem to the point that they actually reported having less gender dysphoria. We can think of two reasons for this decrease. One is that these applicants had received treatment for major nongender problems. It could well be that they had overestimated their gender dysphoria at the time of their application and that they were able to appraise the intensity of their gender problems in a more realistic way at the time of follow-up. Another reason is that the intensity and perhaps also the quality of the gender dysphoria had been different in the NT group. Indeed, at the time of application the variation in scores on the UGS (as reflected by the standard deviations) was much larger in the NT group than in the T group, and some clinical reports suggest that there was far more gender confusion and uncertainty about SRS in the NT group. Some very gender-dysphoric but unstable applicants pursued SRS again when they were older (the DT group). Their general level of functioning was still worse than that of the T group despite the fact that some had received additional treatment.

Limitations

The study also had some limitations, which have to be addressed. One is that despite our replication of the results of our first study, the total number of subjects involved remains small. Moreover, our minimum follow-up period was 1 year. It goes without saying that longer periods of follow-up are needed to assess the ultimate outcome.

A second limitation concerns the possible selection bias of our sample. Adolescents who apply at a young age probably are in relatively favorable circumstances, because their parents, though not happy that their children are

transsexual, are usually supportive of treatment. It is also likely that adolescents with less extreme or more fluctuating cross-gender identities do not pursue SR so early in life. Because we do not know how many adolescent transsexuals do not apply for SR, we do not claim that our patients are representative of all Dutch adolescent transsexuals. Our conclusions are therefore limited to the group that does apply for SR before adulthood.

Third, of those adolescents who apply, only the best-functioning are selected for early medical treatment, the majority being FMs. In contrast to data on sex ratios of our prepubertal GID children (boys to girls 5:1; $N = 120$) and of adult populations (MFs to FMs 3:1; Bakker et al., 1993), the sex ratio of adolescent applicants for SRS in our clinic approaches 1:1 ($N = 125$). As mentioned before, after the first diagnostic phase more FMs than MFs were allowed to start treatment, because they better fulfilled the additional diagnostic criteria for adolescents, namely being psychologically stable and having a supportive background.

Fourth, although the posttreatment interviews were not conducted by the clinicians who had been involved in the treatment, the patients may still have emphasized the positive effects because of their belief that the examiner had a stake in the outcome by virtue of being associated with the same clinic.

Fifth, a different research design in which, on a random basis, half of the applicants who are eligible for treatment would be treated and the other half not, would have been better methodologically. Clearly, however, for ethical reasons such a study is impossible to conduct.

Finally, subject retention was better in the T group than in the NT group. The relatively well-functioning NT patients came to be interviewed and tested, but many of the nonparticipants lived in psychiatric or other institutions. So the data as presented here probably present an optimistic picture and are most likely not representative of the entire group of NT applicants.

Clinical Implications

On the basis of the findings of the previous and current study, it seems reasonable to conclude that early hormone treatment does not necessarily lead to worse postoperative functioning than later hormone treatment. It appears to be possible to prevent false positives when following careful diagnostic procedures. However, careful diagnosis and decision-making in adolescence does not preclude that rejected or withdrawing applicants will seek SRS later in life.

It is important to keep in mind that many applicants are not good candidates for SR and probably never will be

good candidates. Applicants vary greatly in family background, education, psychopathology, motivation to explore gender issues, and outcome. Although psychopathology may be the result rather than the underlying problem of the GID, SR may also be sought as a solution to nongender problems. Starting hormone treatment before adulthood should not be considered when many adverse factors operate simultaneously, despite the possibility that applicants may actually be transsexual. This is because it is more complicated to make an accurate diagnosis in problematic adolescents than in well-functioning adolescents, even for experienced multidisciplinary teams.

The results of our studies point to the desirability of early rather than late medical interventions. Thus far, the patients in our studies were not younger than 16 when hormone treatment was started. This raises the question of the lower limits of such interventions. While a lowering of the age of cross-sex hormone treatment is not yet indicated, other medical interventions offer new possibilities. Recently we described a case of an FM who had attended the gender clinic at age 16 and had SRS at age 18 (Cohen-Kettenis and van Goozen, 1998). At application and since the age of 13, she had already been in treatment by a pediatric endocrinologist with a luteinizing hormone-releasing hormone (LHRH) agonist, depot triptorelin. This substance binds so strongly to the pituitary that endogenous LHRH can no longer exert its effects. Consequently, the pituitary secretion of LH and follicle-stimulating hormone and therefore the gonadal production of sex steroids stops. As a result, when these hormones are administered before puberty, puberty will not occur. Given after the start of puberty, pubertal development will not proceed. An advantage of pubertal delay over cross-sex hormone treatment is that no irreversible steps are taken. Moreover, the therapist and the transsexual have time to explore any problems underlying the cross-gender identity or to clarify gender confusion. Thus far we have successfully used puberty-delaying hormones in a few additional cases. This "diagnostic aid" could become the next phase in the management of adolescent transsexualism.

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