REVIEW

TRANSSEXUALISM: A REVIEW OF ETIOLOGY, DIAGNOSIS AND TREATMENT

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Abstract—Transsexualism is considered to be the extreme end of the spectrum of gender identity disorders characterized by, among other things, a pursuit of sex reassignment surgery (SRS). The origins of transsexualism are still largely unclear. A first indication of anatomic brain differences between transsexuals and nontranssexuals has been found. Also, certain parental (rearing) factors seem to be associated with transsexualism. Some contradictory findings regarding etiology, psychopathology and success of SRS seem to be related to the fact that certain subtypes of transsexuals follow different developmental routes. The observations that psychotherapy is not helpful in altering a crystallized cross-gender identity and that certain transsexuals do not show severe psychopathology has led clinicians to adopt sex reassignment as a treatment option. In many countries, transsexuals are now treated according to the Standards of Care of the Harry Benjamin International Gender Dysphoria Association, a professional organization in the field of transsexualism. Research on postoperative functioning of transsexuals does not allow for unequivocal conclusions, but there is little doubt that sex reassignment substantially alleviates the suffering of transsexuals. However, SRS is no panacea. Psychotherapy may be needed to help transsexuals in adapting to the new situation or in dealing with issues that could not be addressed before treatment.   © 1999 Elsevier Science Inc.

Keywords: Transsexualism; Gender identity disorder; Gender dysphoria, Sex reassignment.

INTRODUCTION

In modern Western societies, individuals pursuing sex reassignment have not always been taken seriously. The wish for sex reassignment surgery (SRS) has often been considered a whim of a disturbed mind. This view of persons with cross-gender identity and/or behavior, however, is not universal. In Oman, for instance, certain males dress, unlike other males, in colored clothes, although they are not allowed to wear the traditional female attire. They wear make-up and perfume and are permitted to share the social life and activities of women, but retain their male name. These men, called "xanith," have a distinct, but not necessarily lower, status [1].

Over the past two decades, the negative attitude toward SRS seems to be changing among professionals. In several countries, they are now diagnosed and treated by specialists, sometimes even in multidisciplinary gender teams. Treatment is often paid for by national health insurance [2, 3] and legal provisions have made birth certificate adaptations possible [4]. Scientific interest in the phenomenon is increasing.

In 1966, the influential book by Harry Benjamin, *The Transsexual Phenomenon*

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[5], made many clinicians aware of potential benefits of SRS. As a consequence, a flood of studies on TS came out. In this article, we describe relevant aspects of clinical practice, review recent empirical support for etiological theories, present data on the relationship between GID in children and adults, give figures on prevalence and sex ratio, and discuss controversies and empirical studies related to treatment. The review is based on a MEDLINE and PSYCHLIT search. The focus was on empirical rather than theoretical studies. In the areas of psychological functioning of transsexuals and SRS follow-up studies, the number of empirical studies was rather high. We made a selection regarding the first topic by highlighting diverging views and giving supporting evidence when available. With regard to the follow-up studies, we chose not to review all 82 studies ourselves, but, instead, to refer to a recent extensive annotated review (see later), soon to be published in English, which obviates the need for an effort toward such a new review. Based on this work, and several more recent studies, we feel it is safe to draw our conclusions regarding the effectiveness of SRS.

TERMINOLOGY

The term *transsexual* first appeared in the professional literature in the work of Hirschfeld in 1923 [6]. In his work, a distinction had not yet been made between transvestism, effeminate homosexuality, and transsexualism. Beginning only in the 1940s the term was used in its modern sense; that is, to denote individuals who desired to live (or actually lived) permanently in the social role of the opposite gender, and who wanted to undergo sex reassignment [7]. The desire for SRS originates from an experienced discrepancy between one's sex of assignment on the one hand and one's basic sense of self as a male or female (*gender identity*) on the other hand. Based on studies of hermaphroditism, Money [8], proposed the two-sided concept considering gender identity/role. According to Money, *gender role* is the public manifestation of gender identity. Transsexualism, in his view, stems from incongruity between the sex of assignment and the two-sided concept of gender identity/role. However, in transsexuals, the gender role (i.e., the public expression of one's gender identity according to Money) is, at least for some period, seriously blocked. In such individuals, gender identity, but not gender role, may thus be in opposition to their sex of assignment. We therefore prefer to use the term as it is increasingly used in the developmental and clinical literature [9, 10]—as behaviors, attitudes and personality traits, which, within a given society and historical period, are typically attributed to, expected from, or preferred by persons of one sex or the other.

In the widely used psychiatric classification system DSM-III, transsexualism first appeared as a diagnosis in 1980 [11]. In the most recent version of this system, DSM-IV [9], the term "transsexualism" was abandoned. Instead, the term *gender identity disorder* (GID) was used for individuals who show a strong and persistent cross-gender identification and a persistent discomfort with their anatomical sex, or a sense of inappropriateness in the gender role of that sex, as manifested by a preoccupation with getting rid of one's sex characteristics or the belief of being born in the wrong sex. The International Classification of Diseases, tenth edition (ICD-10), the other currently used classification system, still lists transsexualism as a diagnosis [12]. In 1973, Fisk [13] proposed the term *gender dysphoria syndrome.* The term en-

compasses transsexualism as well as other gender identity disorders and is often still used as a synonym for GID. Gender dysphoria is the term for distress resulting from conflicting gender identity and sex of assignment.

ATYPICAL GENDER DEVELOPMENT

Adult gender identity and gender role behavior develop gradually over a long period of time and are influenced by multiple, interacting factors, active at different developmental periods [10, 14–16]. Over the last decades, our understanding of this process has increased considerably, but a large part of it still remains enigmatic. Parents of boys with GID often report that, from the moment their sons could talk, they insisted on wearing their mothers' clothes and shoes, were exclusively interested in girls' toys, and played mainly with girls. Such individuals often show distress about being a boy or having male genitals. Recently, it was found that GID children are also less likely than non-GID children to label the sexes correctly, and to make more mistakes when answering questions regarding the stability of gender in time and across situations [17]. This suggests a developmental lag with regard to several aspects of gender learning.

The degree of incongruence between gender identity, gender role, and natal sex may vary. Boys occasionally interested in girls' toys or play, or tomboys who do have some girls' interests, are not considered children with GID. Several factors have been put forward to explain atypical gender development. The best studied are parental/family factors and biological factors. To our knowledge, empirical studies on the influence of broader societal forces on GID, such as the value attached to one gender rather than the other, do not exist.

Parental/family factors

Parental influences, such as extreme closeness to the mother ("blissful symbiosis"), atypical psychosexual development of the parents, father absence, or parental dynamics (such as a maternal wish for a daughter) have been held responsible for the development of GID [18–24]. It was thought that such parental characteristics would give the children insufficient possibilities to identify with the same sex parent and/or expose them to cross-gender reinforcement patterns. However, no solid empirical support was found in subsequent studies testing these hypotheses [25–27] (for a review, see Zucker and Bradley [28]). Paternal (emotional) distance from their GID sons, as measured by recalled shared father–son time was found by Green [25], but this characteristic could be a cause as well a consequence of the feminine development of the boy.

Studies reporting psychopathology in parents of GID children support a parental influence on atypical gender identity development to some extent [28–31]. However, the specific mechanisms leading to GID instead of other clinical conditions remain to be elucidated. It is also possible that child-related factors evoke specific parental responses, such as fostering femininity in a son, in an already unstable or vulnerable parent. Indeed, the clinical impression of Stoller [21], that GID boys were very attractive, was supported in clinical and experimental studies among boys [25, 32], whereas the opposite was found for GID girls [33]. The findings of elevated levels of psychopathology in parents of GID children may, of course, also indicate

that parents with current or past psychological problems tend to seek professional help for their children more often than healthy, functioning parents of GID children.

Retrospective studies in adult transsexuals have shown differences in recalled child-rearing patterns between transsexuals and normative groups. Male-to-female transsexuals (MFs) characterized their fathers as less emotionally warm, more rejecting, and more (over)controlling. Female-to-male transsexuals (FMs) rated both parents as more rejecting and less emotionally warm, but only their mothers as more (over)protective than their female control equivalents rated theirs [34, 35].

Parental influences as a contributing factor to the development of GID seem to find some support in the aforementioned findings. It is conceivable, however, that environmental characteristics such as child-rearing practices, associated with parental pathology and family constellation, lead to some but not all kinds of gender identity disorders. For the development of certain, perhaps mild, forms of gender disturbance, they represent sufficient conditions. For the development of other conditions, environmental factors may be necessary, but not sufficient.

Biological factors

In the beginning of this century, it became clear that the process of sexual differentiation, of becoming male or female, is not completed with the formation of the external genitalia (the criterion for a newborn child's gender assignment). Also, the brain undergoes a differentiation into male or female [36–46], although disagreement exists about certain sexual dimorphisms [47]. In lower mammals, this leads to behavioral patterns that complement the genital status. A male sexual differentiation of the brain occurs in the presence of sufficient amounts of testosterone at the critical period of brain sexual differentiation, whereas the brain becomes female in the absence of testosterone. In animal studies, the presence or absence of testosterone at the time of the critical period of brain sexual differentiation has been shown to influence the morphology of certain brain nuclei [48–50]. The almost dogmatic position that all differences between males and females are biological has been challenged in recent years. It has been proposed that some male–female differences are genetically determined, independently of hormonal mechanisms [51]. Another effect of exposure to testosterone is that the capacity of the pituitary luteinizing hormone (LH) to respond to an estrogen stimulus (the normal ovulation mechanism) is abolished. On this basis, the type of estrogen feedback of LH is further evidence of the earlier sexual differentiation process of the brain.

A supposed discrepancy between genital differentiation, on the one hand, and brain sexual differentiation, on the other hand, has been invoked as an explanation of the phenomenon of transsexualism. In view of the aforementioned data, biomedical research of transsexualism has addressed three areas: (1) gender identity in subjects with an abnormal perinatal endocrine history—an excess of androgens in females and a lack of androgen action in males; (2) the type of estrogen feedback response of LH; and (3) the morphology of brain nuclei that are sex-differentiated.

XX individuals exposed to unusually high levels of testosterone (such as girls with congenital adrenal hyperplasia [CAH], a condition causing prenatal exposure to relatively high levels of androgens) would, in the first type of study, be expected to develop a male gender identity, even if raised as a girl. A few such cases have been

reported [52]. As Meyer-Bahlburg [53] pointed out, individuals with sexual differentiation disorders may be at risk for gender problems (e.g., because of genital ambiguity or social reactions to this ambiguity). In most cases, however, CAH girls who were assigned and consistently raised as girls do not become transsexuals [54–61]. Transsexualism was not found in men or women exposed *in utero* to progestagens, which may have antiandrogenic or androgenic qualities, nor was it found upon exposure to estrogenic drugs, such as diethylstilbestrol (DES) [54, 62–65]. However, in these studies, certain aspects of gender role behavior have been found to be atypical [61, 66–69].

In the second type of study it was assumed that, in humans, just as in lower mammals, the neuroendocrine regulation of LH is a reliable indicator of the sexual differentiation of the brain. Based on this assumption it was postulated that MFs, like females, would show a rise in luteinizing hormone (LH) levels after estrogen stimulation, as a consequence of prenatal exposure to imbalanced sex steroid levels. The opposite was expected to occur in FMs. This hypothesis was based on animal research and supported in a study by Dörner et al. [70]. In other studies, however, conducted with a more rigorous endocrine methodology [71–73], the results could not be replicated.

A third line of research on biological determinants of GID is reflected in studies on sexual dimorphic brain nuclei in transsexuals. In humans, several hypothalamic nuclei have been reported to be sexually dimorphic with respect to size and/or shape: a sexually dimorphic nucleus of the preoptic area of the hypothalamus; the SDN-POA [42]; two cell groups in the anterior hypothalamus (INAH-2 [40, 74, 75], and INAH-3 [40]) and the darky staining posteromedial component of the bed nucleus of the stria terminalis (BNST-dspm) [41]; the suprachiasmatic nucleus (SCN) [43]; and the central subdivision of bed nucleus of the stria terminalis (BSTc) [44]. These sex differences in the hypothalamus are thought to underlie sex differences in gender identity, reproduction, and sexual orientation. Recently, it was found in six MFs, that the BSTc was not only significantly smaller than in males, but also entirely within the size range of females [44]. Zhou et al. was the first study showing a female brain structure in genetically male transsexuals. Nontranssexuals, who had taken estrogens for medical reasons did not show smaller BSTc, making it unlikely that the size differences had been caused by the transsexuals' hormone treatment. The BSTc in animals is a hormone-regulated structure. Thus far no direct evidence exists in the human of a direct relationship between sex hormones and the sex dimorphism of the nucleus.

CORRESPONDENCE BETWEEN CHILDHOOD GID AND TRANSSEXUALISM

Not all children with GID will turn out to be transsexuals after puberty. Prospective studies of GID boys [25, 28, 76, 77] show that this phenomenon is more closely related to later homosexuality than to later transsexualism. These findings are in accordance with retrospective studies, which have shown that male and female homosexuals recall more cross-gender behavior in childhood than male and female heterosexuals [78–80].

The low rates of transsexuals in prospective studies could be explained in several ways. It is possible that gender identity disorders are more mixed in childhood, with

respect to severity, than gender identity disorders in adulthood [81]. In that case, only very few extreme cases would become transsexuals, whereas the mild cases would become homo- or heterosexuals. It is also possible that, in a small group of GID children, transsexualism becomes manifest shortly after puberty, but that, much later in life, a larger number will turn out to be transsexuals. In most of the follow-up investigations on GID children, the children were studied in late adolescence or young adulthood; therefore, not enough time was covered to either confirm or exclude this possibility. Zucker and Green [82] gave three other explanations: (1) the low base rate of transsexualism, which would make it necessary to follow-up much larger samples than has been done so far; (2) the possibility that the process of early treatment itself interferes with the later development of transsexualism; and, less likely, (3) an inclination of parents of future transsexuals to not seek clinical assistance at early ages of their children, so that clinicians would mainly see the "nontranssexual" gender-disordered children.

PREVELANCE AND SEX RATIO OF GID

There are no epidemiological studies providing data on the prevalence of childhood GID. Prevalence estimates of transsexualism among the population 15 years and older are usually based on the number of transsexuals treated at major centers or on responses from registered psychiatrists to surveys concerning their number of transsexual patients within a particular country or region. The numbers vary widely across studies. Earlier studies have reported prevalences in the 1:100,000 to 1:24,000 range for MFs and in the 1:400,000 to 1:100,000 range for FMs [83–86]. From two more recent studies in Singapore and The Netherlands, respectively, higher prevalence rates were found: 1:10,000 men and 1:30,000 women [87, 88]. In both counties, earlier studies also reported a lower prevalence [89, 90]. The higher numbers in the earlier studies may reflect the relative inaccessibility of sex reassignment in the 1960s and 1970s, or the social stigma of transsexuality hindering individuals from seeking SRS, but may also be explained by differences in methodology. For instance, in the former Federal Republic of Germany, estimates based on approved legal applications for sex change (1981–1990) are closer to earlier reports—that is, 1:104,000 for FMs and 1:42,000 for MFs [91]. In addition, a prevalence rate of 1:130,000 was recently reported in a Swedish regional study of 2.5 million inhabitants, with a sex ratio of 1:1 [92]. Other exceptions to the frequently reported M:F sex ratio of approximately 3:1 in adults have been found in studies on transsexualism in Poland and the former Czechoslovakia, before the downfall of communism. Here, M:F sex ratios of 1:5 were reported [93, 94]. The sex ratio of adolescent applicants for SRS at two gender clinics approached a 1:1 relationship in other data ($N=44$ [62]; $N=81$, Cohen-Kettenis, unpublished). Sex ratios of prepubertal children attending gender clinics are approximately five or six boys to one girl (ref. 82: $N=249$; Cohen-Kettenis [unpublished]: $N=61$). From these sex ratios, the sex ratios of GID children, and the previously mentioned follow-up studies of GID children, it seems that a very small, but equal, number of GID boys and girls apply for SRS relatively early in life and that, later in life, more of the original GID boys than girls (and maybe also men who were never GID boys) will apply for SRS.

TREATMENT OF TRANSSEXUALS: PSYCHOTHERAPY OR SEX REASSIGNMENT?

The desirability of SRS as a resolution for the psychological suffering of transsexuals has been a matter of debate since 1930s, when the first sex change operations were performed [95]. Many psychotherapists viewed transsexualism as a delusion, a psychological defense against anxiety-provoking gender role incompetence and/ or a result of unsuccessful separation/individuation from the mother [24, 96–101]. It was felt that one should try to help such individuals to resolve emotional conflicts underlying their wish for sex change by no other means than psychotherapy. Their cross-gender identity should be changed, thereby eliminating the discrepancy between gender identity and body characteristics. However, the existing case reports did not reveal much convincing evidence for complete and long-term reversal of cross-gender identity by means of psychotherapy [102]. This was because:

1. Operationalizations of gender identity differed considerably from report to report; consequently, treatment success was being evaluated on the basis of diverse and sometimes vague (e.g., the clinician's global impression) criteria.
2. A stated disappearance of the wish to undergo SRS was also encountered by clinicians when no psychotherapy was given (Some applicants refrain from SRS, for various reasons, e.g., fear of losing relationships with family and friends or becoming social outcasts, but many years later return to continue the procedure.) So, even the few claimed cures might in fact have been postponements of SRS.
3. The case studies describe patients who were highly motivated to "change" their gender identity, a characteristic rarely encountered in most applicants for SRS.

Outcome studies on extremely gender-dysphoric SRS applicants, who have been randomly assigned to either SRS or psychotherapy and with long-term follow-up, were not available. This led clinicians to look for other solutions to the problem. Because a once firmly established cross-gender identity appeared virtually impossible to influence, the only rational solution to the problem seemed to be the adaptation of sex characteristics to the cross-gender identity.

This solution was supported by the results of some early studies showing no apparent psychological disturbance in transsexuals [103–109]. Later, many more attempts were made to assess the psychological condition of the transsexuals. Currently, many studies are available, contradicting each other to a considerable extent [110–117]. These contradictions are partly a result of differences in methodology and quality of measuring instruments. According to Lothstein [97] they could also be explained by conceptualizing transsexualism as a variant or subtype of borderline disturbances [118]. Transsexuals would therefore exhibit psychopathology primarily when unstructured, projective tests are used or when they are in stressful situations, but not when structured questionnaires are used. This was the case in most of the studies at the time, but recent studies using projective tests do not seem to point unequivocally toward borderline pathology [112, 113, 119]. A more likely explanation of the conflicting results is that, so far, most investigators have treated transsexuals as a homogeneous group. The results, however, might have varied, depending on the composition of the group of subjects under study. Several investigators have proposed a subdivision in types of transsexualism [100, 101, 120–123].

Blanchard [88] investigated "homosexual transsexuals" (i.e., sexually oriented toward individuals of the same biological sex) and "nonhomosexual transsexuals," but the terms "early-onset and late-onset transsexuals" or "primary and secondary transsexuals" have also been used to describe roughly the same groups [124]. Blanchard's "homosexual" group appeared to present earlier for assessment, to report more feminine identification in childhood, to show better social gender reorientation, to have less erotic arousal when crossdressing, and to show fewer postoperative regrets than the heterosexual group [124–127]. The postoperative regrets of the heterosexual group are easily understood, as this group probably has a much longer history of untreated gender dysphoria, has for a longer period unsuccessfully tried to live in the original gender role, and consequently developed stronger ties to their original role (partner, father, colleague). They are usually seen for assessment after a prolonged period of stress, due to unsuccessful coping with their original role. Additional support for the proposed distinction of subgroups comes from a study by Blanchard and Sheridan [128]. They found that homosexual male gender-disordered adults come from sibships with a sibling sex ratio favoring brothers to sisters. The birth order of these gender-dysphoric subjects is also significantly later than that of comparison groups. This sibling situation was not found in nonhomosexual gender-dysphoric groups [128, 129]. Also, homosexual male gender dysphorics were found to be shorter, lighter, and lighter in proportion to their height than nonhomosexual gender dysphorics [130]. Based on these studies, the proposed distinction between at least two subtypes of transsexuals is strongly supported. Indirect evidence comes from the observation that larger proportions of MFs than FMs report a nonhomosexual orientation [114, 130], and that MFs generally have a poorer postsurgical outcome than FMs [131].

It might be that subjects in studies that found a pathology were fully or predominantly nonhomosexual transsexuals, whereas, in other studies, a higher percentage of homosexual transsexuals was included. In future research, as well as clinical practice, this important distinction should no longer be ignored.

DIAGNOSIS

Presently, it is impossible to diagnose transsexualism on the basis of objective criteria. Because psychometrically sound psychological instruments to measure transsexualism do not exist, one is dependent on the subjective information given by the applicants for the diagnosis. Some of them will unconsciously or purposefully distort their life histories or reported gender feelings to reach their goals of SRS. Information from a third party is not always available to substantiate the reports of the applicant. Because of the subjective character of the available information and the importance of the decision to be made, the diagnostic procedure is extensive and time consuming.

The recommended procedure in the Standards of Care of the International Harry Benjamin Gender Dysphoria Association [132], an international professional organization in the field of transsexualism, is to arrive at the SRS decision in two phases. In the first phase, a diagnosis is made based on formal psychiatric (DSM or ICD) classification criteria. For the decision to start the sex reassignment procedure, however, this alone does not provide sufficient information. For instance, in the DSM-

IV criteria, a "strong and persistent cross-gender identification" is not operationalized in terms of duration or scores on certain instruments. Clinicians may therefore disagree on the extremity, and thus the eligibility, for SRS, of an individual patient's GID, despite the fact that formal DSM criteria are applicable. Furthermore, risk factors for postoperative failure have to be estimated, because even extremely cross-gender-identified persons may not be able to undergo the drastic life changes, accompanying sex reassignment.

In the second phase, one's capability to live in the desired role and the strength of the wish for SRS, in the face of disappointments while living in the opposite gender role, is tested.

The first diagnostic phase

Procedure. In this phase, information is gathered on the applicants' general and psychosexual development, the subjective meaning and type of their crossdressing, their sexual behavior and sexual orientation, and their body image. Many, but not all, treatment centers use psychodiagnostic assessment to appraise the intellectual and emotional coping mechanisms of the person and to detect psychopathology [3]. Also, information about the social network is gathered, because, during reassignment, social support is indispensable. To prevent unrealistically high expectations in regard to their future lives, the applicant is also, in this phase, thoroughly informed about the possibilities and limitations of sex reassignment.

Potential risk factors for postoperative failure do not need to be an absolute contraindication for treatment, but they should be taken into account when deciding upon the kind and intensity of guidance during sex reassignment.

Differential diagnoses. Some SRS applicants may simply be confused regarding aspects of their gender. For example, some young male homosexuals have a history of stereotypical feminine interests and crossdressing. They may actually have been children with GID. When they discover their sexual attraction to men, they sometimes mistake, despite an absence of postpubertal cross-gender interests and activities, their homosexuality for a GID. The wish for SRS may also exist in heterosexual men who are sexually aroused by crossdressing (transvestic fetishists), in persons who prefer to be sexless, but have no cross-gender identity, such as in Scoptic syndrome patients [133], in ego-dystonic homosexuals, in persons with transient stress-related crossdressing, or in patients suffering from severe psychiatric conditions (e.g., schizophrenia) accompanied by delusions of belonging to the opposite sex.

When DSM-IV GID criteria are not met completely, the classification "Gender Identity Disorder, Not Otherwise Specified" is used. For the less extreme gender disorders, the ICD has three categories in addition to transsexualism: (1) "Dual-Role Transvestism," when someone wears opposite-sex clothes to experience temporary, but no permanent, membership in the opposite sex, without a sexual motivation for the crossdressing; (2) "Other Gender Identity Disorder"; and (3) "Gender Identity Disorder, Unspecified," the latter two without specific criteria.

Some individuals with a GID, in the media often referred to as transgenderists, do not seek complete sex reassignment. Instead, they try to integrate masculine and feminine aspects of the self and seek only partial medical treatment, either hormones or some forms of surgery. A request for such treatment is still to be treated with great caution by professionals. No formal diagnosis or treatment protocols

comparable to the HBIGDA Standards of Care exist for applicants for this form of treatment, but they are needed.

Adolescents. The diagnostic procedure for adolescents is essentially the same as for older applicants, but is more extensive, and therefore more time consuming. One could argue that adolescents should never be allowed to start sex reassignment, which is the present policy in many countries. The other side of the coin is that early treatment might be beneficial in adolescents in whom secondary sex characteristics have not yet fully developed. Young MFs will, as adults, pass much more easily as females if they do not grow a full beard and develop a low voice. When treated several years later their voice will always keep a male-like quality, and many years of painful and expensive electrical depilation are needed to remove their facial hair. In FMs, when the breasts are still small, breast reduction will be an easier intervention, with less scar tissue. Another argument in favor of early treatment is that eventual arrest in emotional, social, and intellectual development can be warded off more adequately when the ultimate cause of the initial problem has been taken care of. Because early nonpsychological treatment of adolescents is still in a developmental phase, additional criteria for treatment eligibility have been formulated. Thus far, the necessity of these additional criteria has not been tested. These include:

1. Applicants must have shown a lifelong extreme and complete cross-gender identity. Around puberty, these feelings and behaviors must have become more rather than less pronounced.
2. Serious psychopathology is absent, with the exception of problems that are a probable consequence of their living in the unwanted gender role.
3. Applicants must function socially without significant problems (e.g., have a supportive family, do well at school). It is considered important that, throughout the process, the clinician and family have regular contact.

The second diagnostic phase

Requirements. In the second diagnostic phase, one has to live permanently in the role of the desired sex. Family members must be informed about the impending changes, and a new first name must be chosen. Treatment centers vary in their policy on eligibility for hormone treatment. Some require a period of successful cross-gender living without hormone treatment, in addition to a diagnosis of transsexualism; whereas, in others, hormones are prescribed as soon as cross-gender living has started. A certain number of psychotherapy sessions is also required by some clinicians, but obligatory psychotherapy has drawbacks. In most SRS applicants, the motivation for engaging in psychotherapy is very low, because some transsexuals expect that all their problems will disappear after obtaining SRS. Others tend to distrust the therapist because they, sometimes correctly, fear that they will be denied SRS when they are open about their problems.

The underlying idea of the additional requirements for hormone treatment is that applicants should have had ample opportunity to appreciate in fantasy or "in vivo" the familial vocational, interpersonal, educational, economic, and legal consequences of the gender role change. Also, they should have taken time to explore any doubts regarding SRS or unresolved personal issues before irreversible physical changes

are commenced. Consumer organizations are very much against these requirements. They feel that the diagnostic procedures are made unnecessarily lengthy and therefore expensive. Indeed, empirical support confirming the expectation that better posttreatment outcome is related to more stringent requirements is badly needed. Unfortunately, studies evaluating the indispensability of components of the currently employed procedures are nonexistent.

In their decisions, clinicians should take the subtype of transsexualism and its associated risks into account, as heterosexual transsexuals appear to have poorer outcome than homosexual transsexuals [126]. In heterosexual (late-onset) transsexuals, who are more often ambivalent about SRS, the hormone treatment may be adjusted. They may, for instance, be given only antiandrogens for several months. Another option may involve prolongation of the real-life test, or requirement to live in the opposite-sex role without hormones for some time.

Feelings of dysphoria usually decline as a result of both the first bodily changes (see later) and the possibility of living in the new social role. During the real-life test, regular contact with a knowledgeable psychologist or psychiatrist is required. In these sessions the social transformation is a major focus of the discussions, because this transformation stage almost always turbulent.

TREATMENT

Psychological interventions. Persons who are merely gender confused, or whose wish for SRS seems to originate from factors other than a genuine and complete cross-gender identity, are probably best served by several forms of psychological interventions. Such interventions may help persons to better understand and cope with gender issues, and to try out alternative solutions to their problem. Examples of such solutions are part-time cross-gender living (in the desired role only in an accepting environment) or identifying stressors leading to the desire to crossdress and deal with them in nonmaladaptive ways. For individuals who want to explore their options for coping with gender dysphoria, group therapy has also been advocated [134, 135]. The information coming from members who are in different phases of understanding their gender problem, and the support in finding ways to deal with the problem, seems to be particularly beneficial to group members. Marital or family therapy help to solve conflicts between partners or family members rather than intrapsychic conflicts. Pharmacotherapy (low doses of lithium carbonate), combined with psychotherapy, has been reported to be successful in cases of scoptic syndrome, because the medication makes patients more amenable to psychotherapy [133]. In-patient treatment in psychiatric hospitals may be needed for persons suffering from severe psychiatric conditions. Unfortunately, the efficacy of all these interventions has not been investigated in formal studies. Outcome studies, in which specified forms of therapy for homogeneous subgroups of persons with mild or atypical forms of GID are evaluated would undoubtedly contribute to our knowledge of appropriate treatment of GID persons. The relative infrequency of the condition and diversity within the group with respect to relevant treatment goals make it unlikely that such studies will be conducted in the near future.

Psychotherapy or counseling is also an option for SRS candidates. They may, for instance, want to overcome anxieties concerning the future or need support when

"coming out," when dealing with personal loss, or when trying to adjust to their changing life situation.

Hormonal therapy. The social role change during the real-life test usually is supported by hormonal therapy. Before the real-life test is started a medical examination is performed to exclude physical conditions like chromosomal or hormonal anomalies and to prevent complications as a result of hormonal treatment.

In MFs, suppression of the original sex characteristics can be obtained by so-called LHRH agonists or progestational compounds, such as medroxyprogesterone acetate, by interference with androgen production or the androgen receptor by means of drugs, such as spironolactone or flutamide, or by the (most widely used) drug, cyproteronacetate. As a result of this part of the hormone treatment bodily hair growth diminishes drastically as do penile erections and sexual appetite. Because growth of facial hair growth is very resistant to antiandrogen therapy, additional electric hair removal techniques are necessary for successful demasculinization. Also, speech therapy is needed, because the vocal cords will not shorten by antiandrogenic treatment, and the MF needs to learn to use his voice in a female fashion. Surgical techniques to shorten the vocal cord must still be considered experimental. To induce female sex characteristics, such as breasts and a more female-appearing body shape, due to a change of body fat around the waist, hips, shoulders, and jaws, estrogens, are used. In FMs, androgens are used for the induction of male body features, such as a low voice, facial and body hair growth, and a more masculine body shape.

In The Netherlands, hormonal treatment is started in adolescents of 16–18 years in a limited form, when they meet the aforementioned additional criteria for treatment eligibility. In this group, such treatment blocks the development of unwanted sex characteristics without yet the induction of cross-gender characteristics (such as breasts in boys or a beard in girls). This can be achieved by the administration of lutein-hormone-releasing hormone (LHRH) agonists. These compounds bind so strongly to the pituitary that the secretion of luteinizing hormone (LH) and follicle-stimulating hormone (FSH) and eventually the gonadal production of sex steroids discontinues and the prepubertal state is (again) induced [136]. Only after it has become clear that patients benefit from treatment, estrogens are administered to MFs and androgens to FMs. Parents are always to be involved in the treatment of their children and they are required to give their formal approval before the start of any SRS treatment phases. Transsexuals who have been treated early at the Amsterdam gender clinic pass very easily as a member of the opposite gender [137].

Surgery. When the real-life test has resulted in a satisfactory social role change the applicant is referred for surgery. In MFs, vaginoplasty and, in cases of unresponsiveness of breast tissue to estrogen therapy, breast enlargement, are performed. In FMs, breast reduction takes place in all cases. As phalloplasty is still in an experimental phase some FMs prefer to have a neoscrotum with a testical prosthesis with or without a metaidoioplasty, which transforms the hypertrophic clitoris in to a microphallus [138].

RESULTS OF SRS

Since the first sex-change operations, many studies have been carried out to investigate the therapeutic effectiveness of SRS. Pfäfflin and Junge [139] made an ex-

tensive review of 79 studies between 1961 and 1991. After 1991, several more have appeared [137, 140–142]. In most studies, relatively small samples were investigated: only seven studies, with nonoverlapping samples, involved more than 50 subjects [143–149]. Moreover, the studies vary considerably with respect to methodology, number of subjects, and outcome criteria. In many studies postoperative success is defined by a combination of factors, often including "objective criteria" such as employment or housing. In our view, improvement in such conditions should be considered secondary to the main treatment goal— diminution or resolution of gender dysphoria. In spite of these differences between studies, the general conclusion can be drawn that SRS effectively resolves the gender dysphoria transsexuals suffer from. Depending on the methodology, number of subjects, and criteria, varying percentages of success have been noted. Early reviews report satisfactory results in 71.4% of MFs and 89.5% of FMs [84, 150–152]. In a more recent review, the numbers are 87% and 97%, respectively [153]. Negative results, like severe postoperative regretfulness, have also been described. Pfäfflin and Junge [104] studied 18 MFs and 5 FMs who, after having undergone SRS, returned to their original gender role, because of postoperative regrets [154–167]. Many of the evaluation studies are reports on increasing numbers of applicants treated at the same gender clinics. Therefore, percentages of individuals with regrets are difficult to obtain. Weitze and Osburg [91] reported in their study on the legal aspects of the sex change operation, that, of the 733 persons who applied between 1981 and 1990 for legal change of sex status, one person reapplied for legal sex reassignment. When requests for reversal of first-name changes only were included, 57 the total sample of 1422 (0.4%) applied for retransformation.

From the follow-up studies, one may infer that the currently employed, often extensive, diagnostic methods are sufficiently strict. As indicated earlier, until we conduct studies contrasting diagnostic procedures we do not know which elements of the current procedures are superfluous.

After analysis of a number of extensive case histories, Pfäfflin and Junge [139] concluded that most cases of postoperative regret could have been avoidable by means of a careful differential diagnosis, an adequate real-life test, and a reasonable quality of surgery. Factors that have been found to be associated with relatively poor postoperative functioning in empirical studies, not including regretful transsexuals, were "secondary transsexualism" (here, meaning transvestism or effeminate homosexuality), SRS application late in life, bad surgical results, suicidality, inadequate social functioning, loss of work and family, a noncooperative attitude toward clinicians, and enduring resistance against the transsexualism [151, 168, 169]. Group sizes in these studies, however, were very small, making it impossible to calculate which risk factors or combination of factors were the most decisive. The results of most follow-up studies do make clear that alleviation of the gender problems is not equivalent with a trouble-free life. That is why forms of psychological guidance should also be offered after SRS. In some individuals, the need for psychotherapy only develops after subjects have attained their major goals. They then allow themselves to focus on other problematic life issues, or are willing to accept that in their new gender role they encounter more obstacles than they had expected or hoped for. An analysis of types of postoperative problems [114] indicates that psychotherapy or counseling in this phase may contribute substantially to better overall postoperative outcome.

In most respects, FMs fare better than their MF counterparts [114, 131]. This could be a reflection of their more convincing gender role behavior and looks, their less stigmatized childhood, their "type" of transsexualism (implying an earlier age of treatment), or a combination of the factors [149, 150, 170, 171].

CONCLUSIONS

From the present outcome studies it is clear that transsexuals who do not show severe psychopathology, are better off when treated as soon as the diagnosis can be reliably made. Psychotherapy or counseling may be needed in addition to sex reassignment, but will probably be of little use when obligatory.

Transsexualism is not a homogeneous phenomenon and this fact should be addressed as such in research as well as in clinical practice. This will likely lead to a better understanding of the phenomenon and to a more varied treatment approach. Transsexuals with severe concurring psychopathology or belonging to the nonhomosexual or late-onset group should not all be rejected for SRS, but these individuals do need a much more thorough diagnostic procedure, an adjusted (hormone) treatment policy, and more therapeutic support before it is decided that SRS is a viable treatment option.

To make future clinical decisions more empirically based, more large-scale prospective studies, more extensive case descriptions of persons with postoperative regrets, and more detailed accounts of psychotherapies with GID patients, preferably with long-term follow-up, are needed.

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