CHAPTER 5

Predictors of the course and outcomes of sex reassignment:

A prospective study

Yolanda L.S. Smith, M.Sc.[1];
Stephanie H.M. van Goozen, Ph.D.[1];
Abraham J. Kuiper, Ph.D.[2];
Anton M. Verschoor, Ph.D.[3];
Peggy T. Cohen-Kettenis, Ph.D.[1]

[1]Department of Child and Adolescent Psychiatry, University Medical Center Utrecht, and Rudolph Magnus Institute for Neurosciences, Utrecht, The Netherlands.
[2]Department of Medical Psychology, Free University Medical Center, Amsterdam, The Netherlands.
[3]Department of Clinical Psychology, Free University Medical Center, Amsterdam, The Netherlands.

Abstract

Objective: The present prospective study was conducted for three purposes. First, to investigate which of the factors, that are frequently put forward as risk factors for treatment, actually determine whether clinicians consider applicants to be eligible for sex reassignment. Second, to identify which factors predict the course of treatment (duration of the second phase and dropping out of hormone treatment). Finally, to examine which factors predict postoperative functioning. **Method:** Participants were 345 consecutive applicants (233 biological men, 112 biological women) for sex reassignment at the Free University Medical Center in Amsterdam, the largest treatment center for transsexuals in the Netherlands, or at University Medical Center Utrecht. Of these applicants, 232 started hormone treatment, 113 did not. From the group that had started hormone treatment, 36 transsexuals had dropped out of treatment at the time the data collection ended. The group who completed the entire sex reassignment procedure consisted of 196 transsexuals. Of this group 110 went trough the second phase (real-life experience plus hormone treatment) "on time", that is, timely according to the protocol. Another 86 took longer before they underwent surgery. At follow-up 158 transsexuals were interviewed. The pretreatment questionnaires were completed shortly after the subjects had applied for sex reassignment. Age, biological sex, sexual orientation, age at onset of gender dysphoria, GID symptoms in childhood, intensity of gender dysphoria, social support, (dis)satisfaction with sex characteristics, physical appearance, and psychological functioning, all measured at application, were chosen as potential predictors of treatment eligibility, course of treatment and outcomes of sex reassignment. The first two purposes of the study were investigated by means of logistic regression analyses, the third by means of multiple linear regression analyses. **Results:** We found that eligibility for sex reassignment was largely based upon the factors gender dysphoria, psychological stability, and physical appearance. A combination of the factors male biological sex, more psychopathology and more cross-gender symptoms in childhood, yet less reported gender dysphoria at application, increased the probability to drop out of treatment before surgery had taken place. Transsexuals who had started hormone treatment were more likely to complete the second phase "on time", if they were biological males with relatively low negativism scores. Finally, applicants with a *non*homosexual orientation, combined with the presence of psychopathology and dissatisfaction with secondary sex characteristics at assessment, were more likely to function poorer postoperatively, and express more dissatisfaction about the results or consequences of sex reassignment in their lives. **Conclusions:** Some of the potential risk factors for poor outcomes of sex reassignment from the literature or from retrospective studies indeed appeared to be important for predicting the course and outcomes of treatment. Psychological functioning, inconsistencies in reported gender dysphoria, physical appearance, and a *non*homosexual preference deserve particular attention when eligibility for treatment is assessed. However, the data, though unprecedented and valuable because of their prospective nature, do not allow us to draw conclusions about absolute contraindications.

Introduction

Sex reassignment (SR) has been found to be an effective method to treat the most extreme end of the spectrum of gender identity disorders, often referred to as transsexualism. Early reviews report satisfactory postoperative results in 71.4% of male-to-female transsexuals (MFs) and 89.5% of female-to-male transsexuals (FMs) (Lundström et al., 1984; Money and Ehrhardt, 1970; Pauly, 1968, 1981). In a more recent review, the numbers are 87% and 97%, respectively (Green and Fleming, 1990). In this light, it is important to consider the cases in which SR has not been particularly successful. Given the invasiveness and the irreversibility of SR, it is imperative to try to prevent postoperative regret in every single patient. In spite of strict prior selection and counseling during treatment, an estimated one to two percent of those treated express regrets about SR. An estimation is needed her, since few systematic studies specifically addressing negative outcomes of SR have been conducted (Kuiper and Cohen-Kettenis, 1998; Pfäfflin, 1992). Even less is known about the factors predicting postoperative functioning in transsexuals that do not express regrets after treatment. The present study, with a prospective design, was conducted to investigate which factors predict applicants to be eligible for SR, on the one hand, and which factors predict the course of treatment and postoperative functioning, on the other hand. Some elaboration of these issues is in place.

The decision to refer an applicant to enter the SR procedure (including hormone treatment, surgery, and legal changes) requires professionals to take several matters into account. First, a diagnosis should be made. Before 1994, the diagnosis of transsexualism was needed (but not sufficient), according to the criteria of the then applied Diagnostic and Statistical Manual of Mental Disorders, Third Edition - Revised (DSM-III-R, American Psychiatric Association, APA, 1987). In order to be eligible for SR treatment, potential risk factors were also taken into account. In 1994, in the most recent version of this widely used psychiatric classification system, the DSM-IV (APA, 1995), the term transsexualism has been abandoned. Instead, the DSM-IV (APA, 1995) employs the term Gender Identity Disorder (GID), encompassing transsexualism as well as other severe GIDs. The diagnosis GID is consequently more extensive than the diagnosis of transsexualism. In addition to the already mentioned estimation of risk factors, clinicians now need to decide that the applicant suffers from a sufficiently extreme form of GID to consider a person eligible for treatment. This implies determining the position an applicant may take on several dimensions, such as past and present cross-gender behavior, past and current gender identification, intensity and duration of gender dysphoria, or preoccupation with (various aspects of) surgery. Only when they consider applicants sufficiently cross-gendered and/or gender dysphoric on all relevant dimensions, will clinicians probably make the diagnosis of an extreme GID. However, applicants vary considerably with respect to their position on these dimensions and their gender dysphoria may be more or less interwoven with other problems (Diamond, 1996). In weighing and combining all relevant information, clinicians cannot make use of formal algorithms, but have to rely on their experience and knowledge of the literature. The less certain clinicians are about the decisions they have to make, the more likely they will be influenced by additional risk factors when recommending hormone treatment. (The decision to recommend surgery will be made only after patients have fulfilled a lengthy period of cross-gender living, supported by hormone treatment, and is not addressed here). For example, when clinicians are not completely convinced about the intensity of a male applicant's gender dysphoria, they will probably be more inclined to recommend hormone treatment when the applicant is a young, stable functioning and feminine looking man, with a long history of cross-gender feelings, than when he is old, emotionally disturbed, masculine appearing, and has developed cross-gender feelings only since adulthood. After all, an incorrect estimation of possible risk factors could lead to disastrous results, such as postoperative regret to the point of a second SR request. It would be preferable if far-reaching decisions, such as referring someone to start the SR procedure, could be based on solid prospective studies, as they could provide the much-needed information on the kind and importance of selection criteria. However, as mentioned before, such studies hardly exist.

The above led us to particularly investigate which factors, that are known or assessed by diagnosticians before treatment is started, contribute to the clinician's decision whether or not to refer applicants for the SR procedure (beginning with hormone treatment). In the Standards of Care (SOC) of the Harry Benjamin International Gender Dysphoria Association (Meyer et al., 2001), an international professional organization in the field of transsexualism, requirements for allowing applicants to start the SR procedure are formulated. Gender teams in many countries follow these standards (Petersen and Dickey, 1995). However, the SOC do not describe potential risk factors of poor postoperative functioning, while insight in these factors is precisely what is needed for proper

assessment of the eligibility criteria. It is likely that most clinicians follow their clinical experience and -hopefully- their knowledge of the scarce studies on potential risk factors. We summarize the main findings of these studies.

In an extensive review of more than 70 follow-up studies published between 1961 and 1991, Pfäfflin and Junge (1998) found 18 cases of MFs and five FMs who, after undergoing SR, returned to their original gender role. This review comprised approximately 2000 transsexuals. An exact total number of transsexuals, and therefore percentages of regretful persons, cannot be given because some researchers referred to partially overlapping groups of patients. Only a few follow-up studies included sufficient individuals with postoperative regret to allow for comparisons between "successful" and truly "unsuccessful" cases. Also, many researchers gathered their pretreatment data on a post hoc basis. From some follow-up studies, factors that are potentially predictive of postoperative regrets emerged. Wålinder et al. (1978) compared a group of five MFs having postoperative regrets with a group of nine MFs who expressed no regrets. They found that the regretful group differed from the nonregretful group on the following characteristics: a more masculine appearing physical status, more criminal activities, more sexual contact with women, and less social support. Blanchard et al. (1989c) compared percentages of regretful patients in a homo- and heterosexual transsexual group. The terms homo- or hetero-sexuality referred to the patients' pre-operative sexual situation. None of the 97 homosexual FMs and MFs showed any regrets, whereas four of the 14 (28.6%) heterosexual MFs consciously regretted the decision to undergo SR. The regretful and nonregretful heterosexual transsexuals did not differ significantly in any other respect. According to the authors, this might have been the result of the low power of the between-groups comparisons with such small sample sizes. Lindemalm et al. (1987) compared, postoperatively, four MFs with regrets with nine MFs without regrets. A large number of different factors were investigated. They concluded that four out of 35 (!) factors seemed to be associated with postoperative regret. These unfavorable factors were a high age at first request of SR (after age 30), traumatic separation from parents before age six, completed military service, and having done heavy physical labor. However, since both groups were very small, the number of tests high, and some of the *p* values of the unfavorable factors were > .05 (but < .10), it is not clear how much of the results should be attributed to chance. In three different studies late onset gender dysphoria was assumed

to be a risk factor (Blanchard, 1985; Lothstein, 1982; Pfäfflin, 1992), certainly if there are plausible psychological explanations for the emerging gender dysphoria. Pfäfflin (1992) examined two samples in one study to identify and compare factors that had contributed to postoperative regrets. One sample included all the studies from the review published in 1992 in German (Pfäfflin and Junge). They had inferred that poor differential diagnosis, failure to accomplish the real-life experience, and poor surgical results, were the main reasons for regrets reported in the literature. The other sample consisted of Pfäfflin's (1992) own clinical data on 295 subjects who had completed SR, of which three cases reported postoperative regrets. He concluded that for them, personality traits and lack of professional guidance during treatment were the most decisive factors that had contributed to regret. Kuiper and Cohen-Kettenis (1998) reported on 10 transsexuals (9 MFs and 1 FM) in the Netherlands who regretted their SR. They concluded that caution in the treatment of gender dysphoric individuals is needed when a combination of the following risk factors is presented: late onset of the gender conflict, fetishistic cross-dressing, psychological instability and/or social isolation. Since the sample was small and perhaps selective, conclusions from this study should be drawn carefully also. Landén et al. (1998) investigated factors predictive of regret in SR. A retrospective cohort study design was used, in which they compared a nonregretful (n = 205) with a regretful group (9 MFs and 4 FMs). They found that two factors predicted regret of SR, namely lack of support from the patient's family, and the patient belonging to the non-core group of transsexuals. Again, the group of regretful cases was small, and consequently the results need to be interpreted with caution.

In a number of studies, factors were identified within a group of postoperative transsexuals that were associated with relatively good or poor postoperative functioning. In these studies, good or poor functioning was defined in diverse ways and no patients with postoperative regret were included. Ross and Need (1989) investigated surgical factors influencing postoperative adjustment in 14 postoperative MFs. They found that the extent of breast scarring and remaining erectile tissue were strongly negatively related to postoperative psychological adjustment. Lundström et al. (1984) drew a similar conclusion in their review of 29 follow-up studies. Moreover, they also considered a relatively high age at assessment and "secondary transsexualism" (i.e., transvestites and effeminate homosexuals) to be a risk factor for poor outcome. Spengler (1980) concluded from a follow-up study among 19 transsexuals that inadequate social functioning, loss of work and family,

a noncooperative attitude toward the clinicians, enduring resistance against transsexual feelings, auto mutilation, and suicidal attempts were unfavorable factors.

To summarize, many possible factors that influence the result of SR negatively (in terms of regret or poor postoperative functioning) are mentioned throughout the literature. They tend to lie in the area of psychological functioning, sexual orientation, age at assessment, social support, family background and family support, professional support during the treatment process, and surgical outcomes. These factors are repeatedly put forward as relevant for treatment success. However, there is little supporting evidence and the quality of the few existing studies thus far is rather poor. Furthermore, only some of the mentioned factors are known before the decision to start SR is made. Others (for example loss of work) are not.

Therefore, the first aim of the present prospective study was to determine on which factors clinicians actually based their decision to refer applicants for the SR procedure. The factors investigated in this study, all measured at application, were age, biological sex, sexual orientation, age at onset of gender dysphoria, GID symptoms in childhood, intensity of gender dysphoria, social support, (dis)satisfaction with sex characteristics, physical appearance, and psychological functioning. We were primarily interested in factors that could have been known to clinicians before the decision to refer for SR was taken. We therefore did not focus on influencing factors that operate during or after treatment (such as loss of family, or poor surgical outcomes).

The second aim of this study was to investigate which factors could predict the course of the SR procedure. With respect to course, we first studied which factors predicted transsexuals, who had started hormone treatment, to drop out of treatment. Then, we examined which factors predicted patients to complete the entire procedure slowly or timely, according to the timetable of the protocol.

The third aim of the study was to explore which of the factors, measured at assessment, could predict the level of postoperative functioning and treatment satisfaction.

Method

Subjects

A group of 345 consecutive patients applied for SR at the Department of Internal Medicine at the Free University Medical Center in Amsterdam (FUMC) or at University Medical Center Utrecht (UMCU). The FUMC has the largest treatment center for transsexuals in the Netherlands. More than 95% of the Dutch transsexuals who undergo SR are treated here. These applicants may be considered fairly representative of all Dutch applicants. Clinicians with a vast experience in the field of transsexualism diagnosed all of the participants. Due to missing (incomplete) or unreliable data, pretest data were gathered from 325 patients. For an overview of the various sample sizes, including number of applicants, missing values, and patients included in the study, see Table 1.

Of these applicants, 232 started (cross) hormone treatment: they will be called the "starter" group. Pretest data were obtained from 146 MFs and 76 FMs. Not all of these patients who had started hormone treatment, completed SR within the period that the data of this study were collected. A group of 30 MFs and 6 FMs either stopped hormone treatment, or discontinued showing up at appointments: the "drop-out" group. The group who completed SR consisted of 196 patients: the "completer" group. Pretest data of this group were gathered from 117 MFs and 71 FMs. Members of the "completer" group consisted of transsexuals who had completed the SR procedure either timely: the "on time" group (n = 110), or rather slowly: the "slow" group (n = 86). The MFs of the "on time" group completed the second phase (i.e., cross-sex hormone treatment [estrogens for MFs, androgens for FMs], combined with the RLE, until surgery) in 21 months or less; the FMs in 15 months or less. MFs of the "slow" group completed this procedure in more than 21 months, and the FMs more than 15 months. According to the FUMC protocol in the period that the data for this study were gathered, the minimum required duration of hormone treatment before surgery was 18 months for MFs and 12 months for FMs. In the event that hormone treatment passed the required duration beyond the subject's control (e.g., because of waiting lists or practical scheduling possibilities for appointments), we chose to be precautious in assigning subjects to one or the other group. Therefore, an additional three months were added to each of these periods, defining 21 months or less for MFs as a completion of this phase as timely, and more than 21 months as slowly. For FMs the cut off for a timely or slowly completion was at 15 months or less, and more than 15 months, respectively.

The group of applicants who did not start hormone treatment in the first place consisted of 113 patients: the "no-starter" group. Pretest data of this group were obtained from 74 MFs and 29 FMs and varied from 89 to 103.

At follow-up, some of the participants had moved abroad, while others were not traceable, which resulted in a sample of 158 (94 MFs and 64 FMs) subjects, who could be interviewed. Data available at follow-up varied from 136 to 158, due to the fact that not all participants were willing to spend their time on both an interview and filling out questionnaires.

Table 1: Sample Sizes

	All applicants	No-starters	Starters	Drop-outs	Completers	On time completers	Slow completers	Follow-up interview
MFs	220	74	146	29	117	84	33	94
FMs	105	29	76	5	71	24	47	64
Included	325	103	222	34	188	108	80	158
Missing	20	10	10	2	8	2	6	30
Applied	345	113	232	36	196	110	86	188

Procedure

In the diagnostic interviews attention was given to the patients' general and gender development, gender dysphoric feelings, cross-dressing, psychiatric history and current psychological and social functioning. In addition, expectations with regard to the outcomes of SR were explored, and applicants were confronted with possible adversities during and after treatment (e.g., disappointing surgical results or social intolerance). The sessions were not only used to gather and provide information, but also to gain an impression of the applicants' problem-solving abilities, interpersonal functioning, reality testing, as well as potential fluctuations in their gender role behavior.

The patients usually filled out the research questionnaires after the first interview and handed them over to a research coordinator. Clinicians filled out a form when an applicant no longer pursued SR or was rejected for SR. This form was also passed on to the research coordinator.

Posttreatment data were gathered at least one year after surgery. Appointments for an interview and testing were usually made in combination with the patient's hormone checkup at FUMC. If a UMCU patient considered it to be more convenient, an appointment was made at UMCU. Each session took two to three hours. In order to avoid socially desirable responses the subjects were seen by researchers who were not clinically involved. The Ethics Committees of UMCU and FUMC approved the study.

Instruments

Biographical Data

Biographical data were obtained from a semistructured interview (Biographical Questionnaire for Transsexuals, BVT) (see Doorn et al., 1994; Verschoor and Poortinga, 1988). This instrument was used to gather background data at the time of assessment. The BVT contains 211 items on background variables, such as age, education, occupation, questions on gender development, on past and present cross-gender feelings and behavior, on sexuality and partnership, social relationships, family background etc. For purposes of this study, the following items were used: biological sex (1 item), age at application (1 item), age of first signs of cross-gender feelings (1 item), GID symptoms in childhood (11 items, see GIDICS below), and sexual orientation (1 item). Concerning this last item, subjects who exclusively reported a homosexual preference (MFs feeling sexually attracted to biological males; FMs to females) were included in the homosexual group, whereas subjects who reported an asexual, heterosexual, and/or bisexual preference, were included in the *non*homosexual group.

GID symptoms in childhood

The Gender Identity Disorder in Childhood Scale (GIDICS) was constructed from the BVT questionnaire to measure the self-reported presence of GID symptoms in childhood. The scale consisted of 11 items (Cronbach's alpha: .81). The items concerned strong wishes to be of the opposite sex in early childhood, cross-gender appearance of the child, cross-dressing, play- and peer preference, and cross-gender behavior in general, as a child. Each response to the 11 items was recoded into a dichotomous score: whether or not a particular GID symptom was present in childhood. Thus, the total score could range from 0 to 11, with higher scores indicating the presence of more GID symptoms in childhood.

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. Scores range from 12 to 60, with higher scores indicating more gender dysphoria (for psychometric data: see Cohen-Kettenis and van Goozen, 1997).

Social Support

The Social Support Scale (SSS) is a 10-item scale with questions on eight persons, who are closest to the participant (Van Tilburg, 1988). The scalability of this instrument was calculated by means of a Mokken analysis (Molenaar, 1982). The scalability coefficient H, calculated for all close relationships together, was .38. Sum scores range from 0 to 160, with higher scores meaning more experienced social support from significant others.

Body Dissatisfaction

A Body Image Scale (BIS) (Lindgren and Pauly, 1975), which had been adapted for a Dutch sample (Kuiper, 1991), was used. The scale consisted of 30 items divided into three subscales: primary and secondary sex characteristics, and neutral body parts, with higher scores representing more dissatisfaction.

Physical Appearance

The 14-item Appraisal of Appearance Inventory (AAI) reflects the judgement of observers as opposed to being a self-report scale. The AAI concerns the observed masculinity/femininity of several bodily characteristics (e.g., facial hair or chin) of the subject. To assess the applicant's physical possibilities to pass as a male or female, we combined the appraisal of three observers: the diagnostician, a nurse of the gender team, and the researcher. The three independent observers rated their subjective appraisal of the appearance of 14 bodily characteristics of the subject on a 5-point scale of masculinity/femininity. Scores range from 14 to 70, with higher scores representing an appearance that is more incompatible with the new gender (for MFs a more masculine appearance, for FMs a more feminine appearance). Intraclass correlation coefficients between the three observers for each of the 14 items ranged from .68 to .79.

Psychological Functioning

The Dutch Short MMPI (NVM) (Luteyn et al., 1980) is an 83-item shortened Dutch version of the MMPI measuring the following five concepts: Negativism, Somatization, Shyness, Psychopathology, and Extroversion. Higher scores indicate more psychological dysfunction on the first four scales and less psychological dysfunction on the scale Extroversion.

The Dutch version of the Symptom CheckList (SCL-90) (Derogatis et al., 1973; Dutch version: Arrindell and Ettema, 1986) is a 90-item inventory inquiring about the presence of various complaints the week prior to the interview. As we had no specific hypotheses about concepts as measured by the eight subscales of this test, only the sum score, Psychoneuroticism, was used. This score measures the concept of Psychoneuroticism as-a-state or psychological instability. The scores range from 90 to 450, with higher scores indicating more psychological instability.

Both the NVM and the SCL-90 have good psychometric properties.

Postoperative Functioning Scale

The following three instruments were used to construct a scale measuring postoperative functioning and (dis)satisfaction with the treatment at follow-up.

Treatment Satisfaction. Treated transsexuals completed a 21-item semistructured interview about treatment outcomes, experiences during and after SR, treatment evaluation, and feelings of regret (Doorn et al., 1996).

Social and Sexual Functioning. In a 46-item semistructured interview, questions were asked about the transsexuals' current social and sexual life (Doorn et al., 1996).

Public Confrontation Questionnaire. A 20-item questionnaire assessed reactions of the social environment and was used to evaluate the transsexuals' experiences of being able to pass in the new social role (Doorn et al., 1996).

The Postoperative Functioning Scale (PFS) was developed from these three instruments. The scale consisted of 21 items (Cronbach's alpha .87) and was used to assess the transsexuals' level of postoperative functioning. The majority of the items were from the Treatment Satisfaction interview (12); four items were from the Social and Sexual Functioning questionnaire; and five items from the Public Confrontation Questionnaire. Items of the scale concerned satisfaction of the subject with his or her general and social functioning, gender role appearance and behavior, social support and acceptance from others, about having undergone SR, and feelings of regret (for items of the scale, see Appendix). Higher scores on the scale indicate a more poorly level of postoperative functioning and more dissatisfaction with the treatment.

Statistical Analyses

To determine which factors predict referral for SR and the course of the SR procedure, the following logistic regression analyses were performed. First, we identified which of the assessment factors could contribute in predicting applicants to be eligible for hormone treatment or not. In this logistic regression analysis the criterion variable (0-1) was group membership (the "no-starter" versus the "starter" group). Another logistic regression analysis was performed to investigate which of the assessment factors could predict whether transsexuals who had started hormone treatment, would drop out of treatment or not. Here, the criterion variable consisted of the "completer" group and the "drop-out" group. A final logistic regression analysis was performed to examine which factors could identify whether transsexuals who had completed SR would go through the SR procedure "slowly" or "timely" (criterion variable).

Thus, in all three logistic regression analyses the latter group was designated as the one to be predicted by the factors entered into the equation. Since we had no hypotheses about which of the risk factors would actually (better) predict group membership, we performed all three logistic regression analyses with a stepwise procedure first, including all 17 assessment factors: age, biological sex, sexual orientation, age at onset of gender dysphoria, GID symptoms in childhood, intensity of gender dysphoria, social support, (dis)satisfaction with sex characteristics (3 scales), physical appearance, and psychological functioning (2 tests: 1 and 5 scales). To predict as accurately as possible, as many patients as possible were utilized and a second (simultaneous) logistic regression analysis was executed after each of the three first (stepwise) logistic regression analyses, using only the selected factors from the first one that were found to be significant. When the sample sizes were not equally large, the cut value was reset (see Results) at a value that created the highest sensitivity (% correctly classified of the predicted group) as well as the highest specificity (% correctly classified of the other group).

Investigation of which assessment factors predicted relatively good or poor postoperative functioning was analyzed by means of a multiple linear regression analysis. Prediction of postoperative functioning was analyzed with the follow-up data from the sample of transsexuals who had completed SR. The level of postoperative functioning and treatment satisfaction was measured with the PFS. The follow-up data of the "completer" group were used in the analyses from which the PFS was developed. The PFS was

entered in the regression analysis as the dependent variable. Five of the 17 factors measured at pretest were relatively independent (correlations < .35) from the other factors, and were therefore included in the regression model as the predictor variables. Only Psychoneuroticism and the NVM scale Psychopathology correlated .50 with each other. Since we expected scores on both scales to be related to postoperative functioning, we executed a stepwise multiple regression analysis to find out which of the two would be selected into the regression equation. The other five predictor variables were: sex, sexual orientation, physical appearance, satisfaction with secondary sex characteristics, and the Extroversion scale of the NVM. All patients with missing values on any of the variables were deleted listwise. As with the logistic regression analyses, a second (simultaneous) multiple linear regression analysis was executed, using only the significant predictors that were selected in the first (stepwise) analysis, in order to predict as accurately as possible.

Results

Eligibility Criteria

First, we analyzed which factors determined whether applicants were allowed to start the SR procedure or not. We found that eligibility for SR was largely based upon the factors gender dysphoria, psychoneuroticism, and physical appearance (see Table 2). For the precise weight of each predictor variable and the constant in this equation model, see Table 2. A stronger sense of gender dysphoria (higher scores), more psychological stability (lower scores on Psychoneuroticism), and a feminine look for MFs and a masculine look for FMs (lower scores on physical appearance), increased the probability that the clinician referred the applicant to start hormone treatment.

With these three predictor variables in the equation 78% of all the applicants in this study could be correctly assigned to the "no-starter" (52%) or the "starter" (88%) group (cut value: .63).

Prediction of the Course of Treatment

Prediction of Drop-outs

With a second set of logistic regression analyses we found that the following assessment factors could be used to predict whether transsexuals who had started hormone treatment, would drop out of treatment or not. The probability that a transsexual will discontinue

hormone treatment, can be calculated from his or her biological sex, GID symptoms in childhood, psychopathology and gender dysphoria scores (see Table 2). A negative coefficient contributes negatively to the probability of being a drop-out. The relatively high value on biological sex reflects female biological sex. Thus, the combination of being a biological male, with higher scores on psychopathology and on GID symptoms in childhood, yet less symptoms of gender dysphoria at assessment, increases the likelihood that a transsexual will drop out of hormone treatment.

These four predictor variables in the equation correctly predicted 68% of all the transsexuals referred for hormone treatment to be members of the "completer" (68%) or the "drop-out" (69%) group (cut value: .15).

Table 2: B-coefficients and constants of the factors predicting group membership

Predictor variables		**Starter group**		**Drop-out group**		**On time group**	
		B	*p* value	B	*p* value	B	*p* value
BVT:	Biological sex Sexual orientation Age onset gender dysphoria Age at application			-1.82	.006	-1.61	< .001
GIDICS:	GID symptoms childhood			0.18	.026		
UGS:	Gender dysphoria	0.08	< .001	-0.05	.030		
SSS:	Social support						
BIS:	Primary sex characteristics Secondary sex characteristics Neutral sex characteristics						
AAI:	Physical appearance	- 0.05	.003				
SCL-90:	Psychoneuroticism	- 0.01	< .001				
NVM:	Negativism Somatization Shyness Psychopathology Extroversion			0.12	.024	-0.05	.018
Constant		1.00	.442	- 0.04	.972	2.13	< .001

Prediction of Duration of the Second Diagnostic Phase

With a final set of logistic regression analyses, we identified which assessment factors could distinguish between transsexuals who had completed SR slowly or timely. A prediction of an applicant who has started hormone treatment, to complete SR "on time", can be based upon the assessment factors biological sex and negativism (see Table 2). Being a MF, with less reported negativism (lower scores), will increase the likelihood that an applicant will complete SR timely rather than slowly.

With these two predictor variables in the equation, the model correctly classified 71% of the transsexuals that had completed treatment as members of the "slow" (60%) or "on time" (79%) group (cut value: .50).

Prediction of Postoperative Functioning

The third aim of the study was to investigate which assessment factors could predict relatively good or poor postoperative functioning. We found that the level of postoperative functioning could be predicted on the basis of the patient's sexual orientation, psychological stability, and the extent of his or her dissatisfaction with secondary sex characteristics.

The beta weights (in the column Beta in Table 3) show the relative importance of the independent variables contributing to the predictability of the level of postoperative functioning. The probability of the level of functioning of an applicant after SR can be predicted with this equation model (R^2 = .17). The level of postoperative functioning is measured with the applicants' score on the PFS. Since higher scores on this scale indicate poorer postoperative functioning and more dissatisfaction, the predicted score of an applicant on the PFS (at follow-up) will increase when this individual has a *non*homosexual orientation, high psychopathology scores and much dissatisfaction with secondary sex characteristics at assessment. In conclusion, the higher the predicted value, the poorer the level of postoperative functioning and the more dissatisfaction with SR will be likely.

Table 3: Factors predicting postoperative functioning

Model	**B**	**Beta**	***p* value**
Sexual orientation	-3.70	-0.24	.002
Psychopathology	0.43	0.17	.028
Dissatisfaction secondary sex characteristics	0.31	0.28	< .001
Constant	16.80		< .001

Discussion

The first aim of the study was to investigate which combination of factors would influence the clinician's decision to recommend hormone treatment. It was expected that some of these factors pertain to the diagnosis of an extreme form of GID and others to potential risk factors. As it appeared, eligibility for SR was largely based upon a combination of the factors gender dysphoria, psychoneuroticism, and physical appearance. Clinicians assessed applicants to be eligible for hormone treatment, mainly when applicants were found to be more intensely gender dysphoric, more psychologically stable, and when the physical appearance was considered to better match the applicant's new gender role. Because of its inherence to the phenomenon of transsexualism, it is not surprising that strong gender dysphoria appeared to be one of the main factors predicting applicants to be referred for SR. As an unfavorable physical appearance had been identified as a potential risk factor for postoperative regret (Wålinder et al., 1978), it is interesting to observe that the clinicians involved took, consciously or not, this factor into account when deciding upon recommendation for treatment. Psychological instability had also been found to be a risk factor for poor outcome (Kuiper and Cohen-Kettenis, 1998). Apparently, clinicians greatly value the level of psychological functioning of the applicant at the time of assessment. In addition to what professionals know from the literature, they probably have also experienced that the presence of psychological instability may complicate the treatment process. In sum, applicants are most likely to be referred for SR when clinicians assess a combination of strong gender dysphoria, psychological stability, and a favorable physical appearance.

We do not, however, completely dismiss the factors that were not found to predict referral for treatment as unimportant. The three factors combined predicted 88% of the "starter" group. So clinicians must have had other reasons to refer the remaining 12% for hormone treatment. Most likely, in some applicants the intensity and quality of their gender dysphoria, and consequently their diagnosis, was completely decisive for the clinician when eligibility for SR was assessed. In addition, it is conceivable that clinicians appraised risk factors as less harmful, in view of the presence of certain protective factors, such as a strong and reliable support system and/or adequate coping skills of the applicant. Finally, some clinicians might have appraised entirely different factors than the ones found in this study as significant for SR eligibility.

Prediction of the course of treatment was the second aim of the study. One aspect of this aim pertained to investigating which factors predicted whether transsexuals who had started hormone treatment, would drop out of treatment or not. We found that transsexuals who are referred for hormone treatment are more at risk to discontinue prematurely when they are biological men, show more psychopathology, more GID symptoms in childhood, yet less symptoms of gender dysphoria. The greater vulnerability of MFs to drop out of treatment, compared to FMs, is understandable in light of the studies that showed that postoperatively, FMs fare in many respects better than MFs (Kockott and Fahrner, 1988; Kuiper, 1991; Kuiper and Cohen-Kettenis, 1988; Pfäfflin and Junge, 1998; Verschoor and Poortinga, 1988). However, the combination of the four factors is needed to arrive at any kind of prediction. The inconsistency in reporting past and present cross-gender behavior or gender dysphoria deserves particular attention when eligibility is assessed.

Unfortunately, our data did not permit us to distinguish between the impact of psychopathology itself, on the one hand, and of interactive effects of psychopathology with additional external forces, on the other, on the course of treatment. The purpose of this study was not aimed at investigating factors affecting the applicant during treatment. Consequently, we cannot rule out the possibility that it is not psychopathology per se that increases the probability to drop out of treatment, but rather a combination of psychological vulnerability and personal circumstances. The probability to drop out of hormone treatment could be different for two persons with similar psychological anxiety. This difference could be generated by personal circumstances, such as unexpected adversities or lack of social support. Indeed, clinicians do come across individuals that are hesitant about their decision because of unexpected adversities from the environment (e.g., losing custody of their children). One should also bear in mind that the drop-outs of this study stopped hormone treatment during the data collection phase. It is quite possible that, later in their lives, they will reapply, but this remains to be investigated.

At first sight, our finding of an association between having more GID symptoms in childhood and dropping out of treatment is somewhat puzzling. It is in contrast with the literature on risk factors for treatment and counterintuitive in the eyes of experienced clinicians that more GID symptoms in childhood increase the probability of a transsexual to drop out of treatment. However, it appears to be that here, again, we have to review the

combination of findings. In particular, the combination of reporting more GID symptoms in childhood, but less gender dysphoria at assessment should alert the clinician. This inconsistency in reporting cross-gender symptoms may represent either a confusion of the applicant about their development, an (unconscious) exaggeration of the history because current feelings are not clear-cut, or a conscious effort to mislead the clinician. Although with these four factors only 69% of the "drop-out" group could be predicted, applicants presenting with this combination of factors require an adjusted diagnostic procedure.

The other aspect of the second aim of the study was to identify which assessment factors could predict the duration of the second phase. Our data imply that MF applicants reporting less negativism, are more likely to complete the second phase "on time" than other applicants. The rationale for investigating duration of treatment was the assumption that unexpected additional problems, which would be difficult to cope with, would possibly be the main reason for a longer duration. From this perspective, completing the second phase timely would be considered favorable, while a slowly completion would be unfavorable. After many subjects of the "on time" and "slow" group were interviewed however, this assumption appeared not to be correct. Motives to postpone surgery were not only, or not at all, based on unfavorable conditions. Young transsexuals decided to wait for surgery until they had finished school exams, older ones first wanted to move to another city. On the other hand, some individuals that had had problems adjusting to their new life wanted to have surgery as soon as possible. So far, an "on time" or "slow" completion of SR does not appear to indicate a "favorable" or "unfavorable" quality of the duration of this phase. A study investigating whether there are differences in outcomes of SR between these two groups, in terms of their general and psychological functioning, would provide more insight in this matter. This was precisely one of the aims of another study we described in chapter six of this volume.

The final aim of the study was to investigate which assessment factors could predict postoperative functioning. It is important to bear in mind that we investigated relatively good or poor functioning on a continuous scale, as opposed to the dichotomous outcome of "regret" or "no-regret" after SR. In summary, postoperative functioning can be predicted on the basis of a *non*homosexual orientation, a high psychopathology score, and dissatisfaction with secondary sex characteristics.

The finding that psychological instability turned out to be a risk factor for postoperative functioning substantiates the outcome of some studies that were mentioned in the introduction. In accordance with what was found in smaller studies, was our finding that *non*homosexual applicants are more likely to function poorer postoperatively and express more dissatisfaction about the results of SR in his or her life. In one follow-up study, only heterosexual (i.e., *non*homosexual) MFs consciously regretted the decision to undergo SR, whereas none of the homosexual FMs and MFs showed any regrets (Blanchard et al., 1989c). In one of our own studies (this volume), in which we compared homosexual with *non*homosexual transsexuals, the two individuals who expressed any regrets about SR were *non*homosexual also. Belonging to the non-core group of transsexuals was identified as one of two factors predictive of regret (Landén et al., 1998). While the *non*homosexual and the non-core group are not completely alike, many similarities were found (Blanchard, 1985, 1988, 1989a, 1989b; Chivers and Bailey, 2000; Leavitt and Berger, 1990). The outcome that dissatisfaction with secondary sex characteristics predicted poor postoperative functioning can be explained in various ways. Either the appearance of the sex characteristics negatively affected the mood or psychological stability of the individuals, or it negatively affected the way persons were actually treated by the environment, or both of these explanations applied.

Taking all findings into account, this particular "sample" of clinicians who had diagnosed all of the subjects involved in this study, appropriately assessed some of the risk factors that predict the course and outcomes of treatment, yet seemed to have underestimated others. The clinicians particularly recognized the impact of the psychological functioning and the physical appearance of the applicant as significant factors for postoperative functioning. However, clinicians might want to take special notice of MFs who report inconsistencies in past and present gender dysphoria, in addition to the presence of psychopathology. Besides an adjusted diagnostic procedure, these individuals may require special professional care, *if* they are allowed to start hormone treatment. Further, *non*homosexual transsexuals, who show strong dissatisfaction with their secondary sex characteristics, again, combined with high psychopathology, deserve particular attention when treatment eligibility is assessed. These individuals may benefit from additional professional guidance after SR, while adjusting to their new lives and coping with unexpected or adverse consequences of SR or from the environment.

In conclusion, though these factors predict the probable level of postoperative functioning, as stated before, the findings do not allow for absolute contraindications for SR. Nevertheless, the results of this prospective study subscribe the significance of some of the risk factors described in the literature with more conclusive data. Furthermore, factors were found that could assist clinicians identifying individuals who might be at risk for poor outcomes during or after SR. Clearly, more prospective studies are needed to consolidate the predictability of postoperative functioning of transsexuals with SR. The results were an additional incentive for investigating the issues of our next study that were not addressed, yet require to be examined to further support the findings of this study: how does the group who completed treatment actually function postoperatively, and what are the effects of SR within this sample of treated transsexuals.

References

American Psychiatric Association (1987), *Diagnostic and Statistical Manual of Mental Disorders, 3rd ed.* - Revised. Washington, D.C.: American Psychiatric Association

American Psychiatric Association (1995), *Diagnostic and Statistical Manual of Mental Disorders, 4th ed.* Washington, D.C.: American Psychiatric Association

Arrindell WA, Ettema JHM (1986), *SCL-90: Handleiding bij een multidimensionele psychopathologie-indicator (SCL-90, Manual of a multidimensional psychopathology-indicator).* Lisse, The Netherlands: Swets en Zeitlinger

Blanchard R (1985), Typology of male-to-female transsexualism. *Arch Sex Behav* 14:247-261

Blanchard R (1988), Nonhomosexual gender dysphoria. *J Sex Res* 24:188-193

Blanchard R (1989a), The classification and labeling of *non*homosexual gender dysphorics. *Arch Sex Behav* 18:315-334

Blanchard R (1989b), The concept of autogynephilia and the typology of male gender dysphoria. *J Nerv Ment Dis* 177:616-623

Blanchard R, Steiner BW, Clemmensen LH (1993), Gender dysphoria, gender reorientation, and the clinical management of transsexualism. *J Consult Clin Psychol* 53:295-304

Blanchard R, Steiner BW, Clemmensen LH, Dickey R (1989c), Prediction of regrets in postoperative transsexuals. *Can J Psychiatry* 34:43-45

Chivers ML, Bailey JM (2000), Sexual orientation of female-to-male transsexuals: A comparison of homosexual and *non*homosexual types. *Arch Sex Behav* 29:259-278

Cohen-Kettenis PT, van Goozen SHM (1997), Sex reassignment of adolescent transsexuals: A follow-up study. *J Am Acad Child Adolesc Psychiatry* 36:263-271

Derogatis LR, Lipman RS, Covi L (1973), SCL-90: an outpatient psychiatric rating scale - preliminary report. *Psychopharmacol Bull* 9:13-27

Diamond M (1996), Self-testing among transsexuals: A check on sexual identity. *J Psychol Hum Sex* 8:61-82

Doorn CD, Kuiper AJ, Verschoor AM, Cohen-Kettenis PT (1996), *Het verloop van de geslachtsaanpassing: Een 5-jarige prospectieve studie (The course of sex reassignment: A 5-year prospective study).* Rapport voor de Nederlandse Ziekenfondsraad (Report for the Dutch National Health Council)

Doorn CD, Poortinga J, Verschoor AM (1994), Cross-gender identity in transvestites and male transsexuals. *Arch Sex Behav* 23:185-201

Green R, Fleming D (1990), Transsexual surgery follow-up: Status in the 1990s. *Ann Rev Sex Res* 1:163-174

Kockott G, Fahrner EM (1988), Male-to-female and female-to-male transsexuals: A comparison. *Arch Sex Behav* 6:539-546

Kuiper AJ (1991), *Transseksualiteit: Evaluatie van de geslachtsaanpassende behandeling (Transsexualism: An evaluation of sex reassignment).* Utrecht, the Netherlands: Elinkwijk

Kuiper AJ, Cohen-Kettenis PT (1998), Gender role reversal among postoperative transsexuals. *IJT* 2,3, http://www.symposion.com/ijt/ijtc0502.htm

Landén M, Wålinder J, Hambert G, Lundström B (1998), Factors predictive of regret in sex reassignment. *Acta Psychiatr Scand* 97:284-289

Leavitt F, Berger JC (1990), Clinical patterns among male transsexual candidates with erotic interest in males. *Arch Sex Behav* 19:491-505

Lindemalm G, Körlin D, Uddenberg N (1987), Prognostic factors vs. outcome in male-to-female transsexualism: A follow up of 13 cases. *Acta Psychiatr Scand* 74:268-274

Lindgren T, Pauly I (1975), A body image scale for evaluating transsexuals. *Arch Sex Behav* 4:639-656

Lothstein LM (1982), Sex reassignment surgery: Historical, bioethical, clinical and theoretical issues. *Am J Psychiatry* 139:417-426

Lundström B, Pauly I, Wålinder J (1984), Outcome of sex reassignment surgery. *Acta Psychiat Scand* 70:289-294

Luteyn F, Kok AR, van der Ploeg FAE (1980), *NVM Nederlandse verkorte MMPI, Handleiding (Dutch short version of the Minnesota Multiphasic Personality Inventory, Manual).* Lisse, The Netherlands: Swets en Zeitlinger

Meyer III W, Bockting WO, Cohen-Kettenis PT, Coleman E, DiCeglie D, Devor H, Gooren L, Hage JJ, Kirk S, Kuiper AJ, Laub D, Lawrence A, Menard Y, Patton J, Schaefer L, Webb A, Wheeler CC (2001), The standards of care for gender identity disorders (Sixth Version). *IJT* 5,1, http://www.symposion.com/ijt/soc_2001/index.htm

Molenaar IW (1982), Mokken scaling revisited. *Kwantitatieve methoden* 3:145-164

Money J, Ehrhardt AA (1970), Transsexuelle nach dem Geschlechtswechsel (Transsexuals after sex change). In: *Tendenzen der Sexualforschung (Trends in sex research),* Schmidt G, Sigusch V, Schorsch E, eds. Stuttgart, Germany: Enke, pp 70-87

Pauly I (1968), The current status of the change of sex operation. *J Nerv Ment Dis* 147:460-471

Pauly I (1981), Outcome of sex reassignment surgery for transsexuals. *Aust N Z J Psychiat* 15:45-51

Peterson ME, Dickey R (1995), Surgical sex reassignment: A comparative study of international centers. *Arch Sex Behav* 24:135-156

Pfäfflin F (1992), Regrets after sex reassignment surgery. *J Psychol Hum Sex* 5:69-85

Pfäfflin F, Junge A (1992), *Geschlechtsumwandlung: Abhandlungen zur Transsexualität (Sex change: Treatises on transsexualism).* Stuttgart, Germany: Schattauer

Pfäfflin F, Junge A (1998), *Sex Reassignment: Thirty years of international follow-up studies SRS: A Comprehensive Review, 1961-1991, English ed.* Düsseldorf, Germany: Symposion Publishing, http://www.symposion.com/ijt/pfaefflin/1000.htm

Ross MW, Need JA (1989), Effects of adequacy of gender reassignment surgery on psychological adjustment: A follow-up of fourteen male-to-female patients. *Arch Sex Behav* 18:145-153

Spengler A (1980), Kompromisse statt stigma und unsicherheit. Transsexuelle nach der operation (Compromises instead of stigma and doubts. Transsexuals after surgery). *Sexualmedizin* 9:98-103

Van Tilburg T (1988), *Verkregen en gewenste ondersteuning in het licht van eenzaamheidservaringen (Received and desired support related to the experience of loneliness).* Utrecht, The Netherlands: Elinkwijk

Verschoor AM, Poortinga J (1988), Psychosocial differences between Dutch male and female transsexuals. *Arch Sex Behav* 17:173-178

Wålinder J, Lundström B, Thuwe I (1978), Prognostic factors in the assessment of male transsexuals for sex reassignment. *Br J Psychiatry* 132:16-20

Appendix

The Postoperative Functioning Scale

Questions of the male-to-female version

Are the people in your environment accepting you as a woman?
1. Yes, everyone
2. Yes, most people
3. Yes, some
4. No

Are the people in your environment supporting you in your new gender role?
1. Yes, everyone
2. Yes, most people
3. Yes, some
4. No

Do you know people you can rely on in hard times?
1. Yes, several
2. Yes, a few
3. No

Do you presently feel lonely?
1. No
2. Yes, somewhat
3. Yes, very much

I notice people are looking at me and sometimes ridicule or laugh at me.
1. No
2. Occasionally
3. Yes

People approach me as a woman, even if I think I look good.
1. Never
2. Yes, sometimes
3. Yes, often

I feel people take me seriously.
1. Most people do
2. Only a few close friends
3. No
4. Yes, completely

Sometimes I think: if people do not take me seriously as a woman, what has been the use of undergoing SR?
1. I never think that
2. I sometimes think that
3. I often think that

Because of difficulties with people around me I feel lonely.
1. I have no difficulties with people around me
2. There are some difficulties, but it does not bother me
3. This is sometimes true
4. Very often

Do you currently regret to have undergone SR?
1. No
2. Yes, somewhat
3. Yes, very much

Have you ever had feelings of regret since you started treatment about your decision to live as a woman?
1. No
2. Yes, somewhat
3. Yes, very much

If you were to decide about undergoing SR again, would you make the same decision?
1. Yes, I would do everything over again
2. Yes, but I would do things differently
3. No, I would make another decision

Does it ever occur that you live as a man again?
1. No, never
2. Yes, sometimes in public, but at home I always live as a woman
3. Yes, in public as well as at home

Did you ever think during treatment: “I wish I had never started all this“?
1. Never
2. Occasionally
3. Regularly
4. Often
5. Very often

Do you face the future with confidence, as a woman?
1. With a lot of confidence
2. With some confidence
3. With little confidence
4. Without any confidence

Are people around you always treating you as a woman?
1. Never
2. Almost never
3. Sometimes
4. Mostly
5. Almost always
6. Always

How satisfied are you about your own behavior as a woman in contact with other people?
1. Very satisfied
2. Satisfied
3. Somewhat satisfied
4. Dissatisfied
5. Very dissatisfied

Do you ever doubt that you are able to carry on as a woman socially?
1. Never
2. Sometimes
3. Regularly
4. Often
5. Very often

Do you ever doubt whether your appearance is feminine enough?
1. Never
2. Sometimes
3. Regularly
4. Often
5. Very often

How satisfied are you with your life?
1. Very satisfied
2. Satisfied
3. Somewhat satisfied
4. Dissatisfied
5. Very dissatisfied

How happy do you feel?
1. Very happy
2. Happy
3. Somewhat happy
4. Unhappy
5. Very unhappy