Original article / *Araştırma*

Voice-related gender dysphoria: quality of life in hormone naïve trans male individuals

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ABSTRACT

Objectives: *This study investigates voice-related gender dysphoria and its impact on quality of life in hormone-naïve trans male individuals.* ***Methods:*** *The study was conducted by the Gender Dysphoria Clinic and Voice Clinic of a tertiary hospital referral center. Seventeen hormone naïve trans males referred to Voice Clinic and completed all the scales in a single sitting were included. Voice Handicap Index-10, Voice-Related Quality of Life, Transsexual Voice Questionnaire, and Self-Perception of Voice Masculinity Scale were used to assess voice-related gender dysphoria and quality of life.* ***Results:*** *Voice-related measures scores were seen to be significantly adversely affected in the pretreatment period when compared with normative data. All the three instruments showed a significantly strong correlation with each other. The voice-related quality of life showed an increasing trend in accordance with the current self-perception of voice masculinity. This group's future voice desire showed variation among individuals.* ***Discussion:*** *Trans male individuals cannot be considered as a homogeneous group in terms of voice gender perception and expectation. Considering the heterogeneity, individually tailored management strategies should be established. Voice-related gender dysphoria should be evaluated and managed carefully from the very beginning for treatment-seeking trans male individuals.* ***(Anatolian Journal of Psychiatry 2020; 21(1):53-60)***

Keywords: *trans, transmasculine, transgender, voice, quality of life, gender dysphoria, trans male*

Sesle ilişkili cinsiyet disforisi: Hormon-naif trans erkek bireylerde yaşam kalitesi

ÖZ

Amaç: *Bu çalışmada hormon-naif trans erkek bireylerin sesle ilişkili cinsiyet disforisi ve yaşam kalitesine etkisinin araştırılması amaçlanmıştır.* ***Yöntem:*** *Çalışma üçüncü basamak referans merkezi olan bir üniversite hastanesinin Cinsiyet Disforisi ve Ses Kliniğinde ortak olarak yürütüldü. Değerlendirme ölçeklerini aynı oturumda tamamlayan 17 hormon-naif trans erkek birey çalışmaya alındı. Sesle ilişkili cinsiyet disforisi ve yaşam kalitesini değerlendirmek için Ses Handikap Endeksi-10, Sesle-İlişkili Yaşam Kalitesi Ölçeği, Transseksüel Ses Ölçeği ve Sesin Erkeksiliğini Algısal Değerlendirme Ölçeği kullanıldı.* ***Bulgular:*** *Normatif veriler ile karşılaştırıldığında, sesle ilişkili ölçek toplam puanlarının istatistiksel yönden anlamlı düzeyde olumsuz etkilendiği görüldü. Üç ölçeğin birbirleriyle güçlü ilişkisinin olduğu bulundu. Sesle ilişkili yaşam kalitesi, mevcut ses erkeksiliği algısına uygun olarak artan bir eğilim göstermekteydi. Bu grubun gelecekteki ses beklentisinin bireyler arasında farklılık gösterdiği saptandı.* ***Tartışma:*** *Trans erkek bireyler, ses cinsiyet algısı ve beklenti açısından homojen bir grup olarak kabul edilememelidir. Heterojenliği göz önünde bulundurularak, kişiye özel yönetim stratejileri oluşturulmalıdır. Sesle ilişkili cinsiyet disforisi, tedavi arayışında olan trans erkek bireyler için, cinsiyet geçiş sürecinin en başından itibaren dikkatle değerlendirilmeli ve yönetilmelidir.* ***(Anadolu Psikiyatri Derg 2020; 21(1):53-60)***

Anahtar sözcükler: *Trans, transmaskülen, trans cinsiyet, ses, yaşam kalitesi, cinsiyet disforisi, trans erkek*

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INTRODUCTION

The term transgender people, or 'trans', refers to people whose gender identity differs from the sex they were assigned at birth based on their sexual characteristics.[1]

Recent epidemiological studies of the transgender population have shown an increase in the general prevalence, as well as in the number of those seeking gender reassignment treatment.[2,3] The World Professional Association for Transgender Health (WPATH) has developed a standard of care guideline, highlighting interdisciplinary collaboration, in order to provide convenience through standardized approaches for gender transition requests.[4] In Kocaeli University's Gender Dysphoria Clinic, established in 2004, trans individuals are managed by an interdisciplinary team including a psychiatrist, plastic surgeon, endocrinologist, gynecologist, urologist, and forensic medicine specialist.[5] Recently, a voice specialist has been included in this team and a standardized voice assessment has been added to the protocol.

Transgender individuals might experience severe problems, known as gender dysphoria, due to a discrepancy between gender assigned at birth and gender identity.[4] Although gender dysphoria tends to improve following gender identity transition, the gender identity transition process takes up to two years and its socioeconomic burden can further extend this period. Both during and after the gender transition process, trans individuals who are trying to adapt to their current situation are faced with very serious physical and psychosocial problems in terms of access to community and acceptance by the community.

Voice constitutes a very important part of the community's gender perception and individual's gender expression. Features of voice and speech contribute to the production of gender in communication exchanges. Since the voice is an important gender indicator, obtaining a voice that is appropriate for gender is a necessary and crucial part of the transition process for the acceptance of the new gender identity of trans individuals.[6] In addition, verbal communication gives gender clues during socialization. Especially in patriarchal communities, feminine and masculine voice and gender identities are defined and protected as indispensable elements of a natural and compulsory order.[7] Due to the incongruent voice features with the gender identity, the problems faced by these individuals who have already been going through a challenging period may lead to a much more difficult transition process with a negative effect on their quality of life (QOL).[8-10] Thus, as described above, gender-related voice aspects of trans people's should not be underestimated. In this article, we use the term 'voice-related gender dysphoria' for the incongruent voice features between the sex assigned at birth and gender identity.

In the past two decades, there has been a growing number of voice related publications in this area especially those focusing on the trans peoples' own perceptions and expectations, as well as the impact on QOL.[8-10] However, these studies have mostly focused on the trans female vocal situation. There is a paucity of studies investigating trans male voice related experiences, especially before hormonal therapy.[11,12] Thus, how trans male individuals perceive their voices prior to gender transition treatment and what is their voice-related QOL is one of the issues that protects its obscurity.[12,13]

Considering the dearth of literature, the purpose of this study was to investigate voice-related gender dysphoria as well as its psychosocial aspects in hormone naïve trans male individuals by using voice specific QOL instruments.

METHODS

Patient selection

In Kocaeli University's Gender Dysphoria Clinic, a standardized gender transition process for trans individuals has been applied since 2004. Starting in July 2018, all trans individuals were additionally referred to our voice clinic. The phoniatric evaluation protocol included a perceptual assessment of voice, initial voice records, and standardized subjective rating scales as well as video laryngostroboscopic examination in their postmenstrual period. In this study, 17 hormone-naïve trans males who were assessed between September 2018 and December 2018 and completed all the scales in a single sitting were included. The exclusion criteria were as follows: age under 18 years, co-existence of history or findings indicating organic voice disorder, any previous history of gender assignment treatment or findings, such as hormone therapy, mastectomy, voice therapy, and either incomplete scales or completion of scales in multiple settings.

This observational, cross-sectional study was conducted following approval obtained from the

Institutional Review Board of the University of Kocaeli Medical School. Written informed consent was obtained from all individual participants included in the study.

Outcome measures

Evaluation Form: All participants in the study were asked to complete an evaluation form developed by the investigators that included age, job, educational status, employment status, relationship status, alcohol and/or smoking history, socioeconomic status, family and/or social support, chest binding, posture change, outward appearance and current social gender identity.

The commonly used, self-reported, outcome measures, Voice Handicap Index-10 (VHI-10) and Voice-Related Quality of Life (V-RQOL) and a population-specific questionnaire, the Transsexual Voice Questionnaire (TVQ), were used to assess V-RQOL and its psychosocial aspects in hormone naïve trans male individuals. A self-perception of voice masculinity scale (SPVM) was used to assess their voice-related gender dysphoria. Details of each measure are given below.

Voice Handicap Index-10 (VHI-10): VHI-10 is a self-administered questionnaire consisting of 10 items for quantifying patients' perception of their voice handicap.[14] It is a shortened version of the Voice Handicap Index (VHI), developed by Jacobson et al, with a high correlation.[15] Validity and reliability of VHI-10 in a Turkish population has been studied by Kılıç et al.[16] It is a five-point Likert-type scale ranging from 0 (never) to 4 (always). It evaluates three domains with four items on the emotional, three items on the physical and three items on the functional subscales. Higher scores on the VHI-10 are indicative of a greater voice handicap. A VHI-10 score >11 is considered abnormal.[17] (here: Cronbach's alpha=0.97).

Voice-Related Quality of Life (V-RQOL): V-RQOL, is a self-administered measurement consisting of 10 items evaluating the impact of voice-related problems experienced during the person's daily life, developed by Hogikyan and Sethuraman.[18] It is a five-point Likert-type scale ranging from 1 (none, not a problem) to 5 (bad as it can be). It evaluates two domains with four items on social-emotional and six items on physical functioning subscales. In addition, the total QOL effect can also be calculated. Both domain and total V-RQOL scores were standardized to a scale of 0 to 100, with a higher number indicating a better voice-related QOL. Validity and reliability of V-RQOL in a Turkish population has been studied by Tezcaner and Aksoy.[19] The cut-off value for V-RQOL is given as 91.25.[20] (here: Cronbach's alpha=0.94).

Transsexual Voice Questionnaire (TVQ): TVQ for male to female (TVQ^{MtF}), is a self-administered questionnaire consisting of 30 items providing information concerning self-perception of voice and its impact on everyday life, developed and validated by Dacakis et al. for trans females.[21,22] Although designed for trans female, an adapted version of the TVQ^{MtF} for trans male (TVQ^{FtM}) has been used in recent studies.[11,23] Likewise, we adapted the wording in eight of the 30 items to accommodate our trans male individuals (e.g., the item 'It distressed me when I'm perceived as a man because of my voice' was changed to 'It distressed me when I'm perceived as a woman because of my voice'). The remaining 24 items were used as in the same original questionnaire (e.g. 'I feel discriminated against because of my voice'). A self-created, adapted version of the authorized Turkish translation of the TVQ^{MtF}, TVQ^{FtM}, was used in this study (available on http://www.shelaghdavies.com/). Thus, although the TVQ has not been validated for trans male, we thought that it would be appropriate to use the adapted version in the present study (here Cronbach's alpha=0.97). Each item has four possible choices with a score ranging from 1 (never or rarely) to 4 (usually or always). The total score varied between 30 and 120. Higher scores on the TVQ^{FtM} relate to a greater perception of negative voice-related experiences and negative psychosocial impact. Eleven items out of 30 relate to anxiety and avoidance, eight relate to gender identity and eleven relate to voice quality.[23]

Self-Perception of Voice Masculinity (SPVM): Participants rated their self-perception of the masculinity of their voice (SPVM) both for the current and desired voice gender perception on a five-point Likert scale and each item has the following possible choices ranging from 1 to 5: 'very female', 'somewhat female', 'gender neutral', 'somewhat male' and 'very male'. This rating scale was based on equal interval scales anchored with very male/masculine at one end and very female/feminine at the other, as used with the TVQ^{MtF}.

Acoustic analysis

The Computerized Speech Lab software, Multi-Dimensional Voice Program (MDVP) model 5105 (Kay Elemetrics Corporation, Lincoln Park,

New Jersey, USA) was used for analyzing voice sample. Average of recorded two voice samples of a sustained vowel/a/ was used following a demonstration by the examiner in a quiet room with less than 50 dB of background noise with a microphone placed at a distance of 10 cm. The acoustic analysis parameter of interest was mean fundamental frequency (Mean F0) which is commonly considered the major cross-gender difference.

Statistical analysis

Statistical analysis was performed with SPSS v22 (IBM Corp., Armonk, NY, USA). Descriptive statistics are reported for all variables measured. Shapiro-Wilk test and graphical examinations were used to test the normality of the data. Non-parametric tests were applied to non-parametric data and at instances when the sample size was small. Data are expressed as median (range) and as mean (standard deviation). The correlation coefficients analyses between the VHI-10, V-RQOL, TVQ^{FtM} and SPVM measure scores were performed by Spearman's correlation test. Mann Whitney U test was used to compare the VHI-10, VRQOL and TVQ^{FtM} scores for sociodemographic characteristics. All differences associated with a chance probability of 0.05 or less were considered statistically significant.

RESULTS

Of the seventeen participants, the median age was 24 (range: 18-53) years. One of the seventeen participants' social gender identity and outward appearance was still female, due to the very conservative work environment. Sociodemographic and gender transition-related characteristics of the participants are shown in Table 1.

The median VHI-10 total score was 18 (range: 0-37) which is considered abnormal. The median V-RQOL total score was 72.5 (range: 7.5-100) and indicated low QOL. Of the seventeen participants, only five had VHI-10 total scores below 11 and V-RQOL total scores above 91.25. The median TVQ^{FtM} total score was 59 (range: 33-111). The median SPVM was 3 (range: 1-3), meaning gender neutral. The median Mean F0 was 190 Hz (range: 158-262) meaning within normal limits of cisfemale.

The details of each self-assessed voice measure, VHI-10, V-RQOL, TVQ^{FtM}, SPVM and Mean F0 are summarized in Table 2.

We have investigated the relationship between sociodemographic characteristics of the participants with the total scores of the voice assessment measures. None of the sociodemographic characteristics showed a significant relationship.

Table 1. Sociodemographic and gender transition characteristic data of the participants

	n	%
Sociodemographic characteristics		
Educational status		
College	8	47.1
High school	8	47.1
Middle school	1	5.9
Employment status		
Student	4	23.5
Employed	10	17.6
Unemployed	3	58.8
Socioeconomic status		
Moderate	17	100.0
Relationship status		
Partnered	9	52.9
Single	8	47.1
Married	-	
Smoking habit	14	82.4
Alcohol habit	-	
Gender transition-related characteristics		
Presence of family support	8	47.1
Presence of social support	17	100.0
Outward appearance		
Male	16	94.1
Female	1	5.9
Social gender identity		
Male	16	94.1
Female	1	5.9
Chest binding	10	58.8
Posture change	15	88.2

The V-RQOL scores showed a significantly strong correlation with both the VHI-10 and the TVQ^{FtM} scores ($p<0.01$). The V-RQOL scores showed a significant moderate correlation with the SPVM ($p<0.05$). Correlation coefficients between the three scales are summarized in Table 3.

The V-RQOL, VHI-10 and TVQ total scores were compared based on the current and desired SPVM of participants and these results are summarized in Table 4. None of the participants perceived their voice to be very male although fourteen of the 17 participants (82.35%) reported that they desired to have a very male voice. In addition, voice-related QOL showed an increasing trend in accordance with current SPVM.

Although 14 participants reported everyday

Table 2. Descriptive statistics for V-RQOL, VHI-10, TVQ^{FtM}, and SPVM scores with MF0 of the participants

	Mean±SD	Median (range)
V-RQOL		
Social-Emotional	65.07±32.10	68.75 (0-100)
Physical-Functioning	68.63±25.69	70.83 (4.17-100)
Total	67.20±27.21	72.50 (7.5-100)
VHI-10		
Emotional	7.41±5.40	7 (0-16)
Physical	5.12±4.33	5 (0-12)
Functional	4.06±3.38	4 (0-9)
Total	16.59±12.73	18 (0-37)
TVQ^{FtM}		
Voice quality	23.29±9.68	22 (11-44)
Gender identity	20.82±8.02	20 (9-32)
Anxiety and avoidance	22.35±8.71	21 (11-35)
Total	66.47±24.95	59 (33-111)
SPVM	2.53±1.01	3 (1-4)
Mean F0 (Hz)	191.94±26.67	190 158-262)

V-RQOL: Voice-related Quality of Life; VHI-10: Voice Handicap Index-10; TVQ^{FtM}: Transsexual Voice Questionnaire Female to Male; SPVM: Self-perception of Voice Masculinity; Mean F0: Mean Fundamental Frequency; Hz: Hertz; SD: standart deviation

Table 3. Correlation of the V-RQOL, VHI-10, TVQ^{FtM} total scores and SPVM of the participants

	V-RQOL	VHI-10	TVQ^{FtM}	SPVM
V-RQOL	-			
VHI-10	-0.894**	-		
TVQ^{FtM}	-0.854**	0.857**	-	
SPVM	0.532*	-0.466	-0.635**	-

*V-RQOL: Voice-related Quality of Life; VHI-10: Voice Handicap Index-10; TVQ^{FtM}: Transsexual Voice Questionnaire Female to Male; SPVM: Self-Perception of Voice Masculinity; Spearman's correlation test; *: p<0.05; **: p<0.01*

Table 4. Median VRQOL, VHI-10, and TVQ^{FtM} total scores based on current and desired self-perception of voice masculinity

	n	V-RQOL Median (range)	VHI-10 Median (range)	TVQ^{FtM} Median (range)
Current SPVM				
1 (very female)	3	32.5 (7.5-72.5)	36 (18-37)	99 (92-111)
2 (somewhat female)	5	62.5 (42.5-92.5)	17 (2-31)	60 (40-84)
3 (gender neutral)	6	77.5 (42.50-100)	13.5 (0-34)	54 (41-95)
4 (somewhat male)	3	97.5 (55-100)	2 (0-22)	35 (33-59)
5 (very male)	-			
Desired SPVM				
3 (gender neutral)	2	87.5 (75-100)	11.5 (3-20)	54 (49-59)
4 (somewhat male)	1	77.5 (77.5-77.5)	13 (13-13)	56 (56-56)
5 (very male)	14	61.2 (7.50-100)	18 (0-37)	70 (33-111)

V-RQOL: Voice-related Quality of Life; VHI-10: Voice Handicap Index-10; TVQ^{FtM}: Transsexual Voice Questionnaire Female to Male; SPVM: Self-Perception of Voice Masculinity;

smoking habit history; none of them reported their smoking habits as a method of altering voice gender presentation, when questioned.

DISCUSSION

Transgender people exhibit lower QOL due to their incongruent gender-related characteristics with the sex assigned at birth.[13] A recent meta-analysis has evaluated QOL under four main heading; voice-related QOL; sex-related QOL; body image-related QOL; and general QOL. Nobili et al.[13] emphasized that there are relatively scarce number of well-designed studies on voice-related QOL, of which only one includes trans males.[24] However, none of these studies evaluated the pretreatment status of the participants with standardized instruments.[9,10,24,25] To our knowledge, this study is the first study focusing on pretreatment voice-related aspects of a homogeneous group of trans male individuals using standardized voice specific scales including trans-specific instruments in addition to their current self-perception and expectation of masculinity.

Patients' reported outcome measures are important to describe the effect of voice-related concern affecting any individual's overall QOL. Jacobson et al reported that many patients were unaware of their current vocal status and its effect on their health and well-being.[15] Only after having completed the scale, did they become aware of the severity of the problem.

In order to capture all aspects of voice-related gender dysphoria in hormone naïve trans male individuals, we combined the two most commonly used voice-specific self-assessment instruments (the VHI-10, the V-RQOL) with the two population-specific voice instruments (the TVQ^{FtM} and SPVM). We found that VHI-10, V-RQOL, and TVQ^{FtM} were strongly correlated with each other. In addition to this, voice-related QOL scores were seen to be significantly adversely affected in the pretreatment period when compared with previous normative data.[17,20]

T'Sjoen et al. used the VHI instrument to evaluate the impact of voice on QOL in a transgender population.[24] This study reported that trans males generally obtain acceptable masculine voice when compared with trans females' feminine voice. However, despite hormone treatment, some trans males still have high VHI scores and even some of those with good VHI score still indicate voice-related gender dysphoria for example when speaking rapidly and/or using a more outspoken voice. The authors conclude that in this specific group, more specialized tools are required to correctly assess these individuals.[24] Kocak et al. used the V-RQOL measure and have reported improved voice satisfaction following voice feminizing surgery in three trans female individuals.[26] Bultynck et al. used the TVQ measure only in both trans males and females to evaluate the effect of hormone therapy on self-perception of voice.[23] In this heterogeneous sample of young trans individuals, baseline TVQ^{FtM} subscale scores were similar to that of our group. They reported that the main change of self-perception of voice, attributed to hormonal therapy in trans male individuals, was mostly determined in the first three months of therapy. Watt et al used SPVM and TVQ^{FtM} measures and reported that the voice features more congruent with gender identity based on the effect of hormonal treatment, leads to greater well-being in trans male individuals.[11]

Although voice satisfaction in trans male people has been assumed to be problem-free, due to androgen treatment effects, recent studies have reported that in fact this is not the case.[12,27] Not only do the individuals have a range of responses to hormonal therapy, but also final results may not live up to their expectations.[27,28] Ziegler et al. reported an overall rate of 16% for incomplete voice satisfaction despite hormonal treatment and for some subgroups the dissatisfaction rate increase to 30%.[29] It appears that although testosterone treatment produces a change in the 'desired direction', the individual's self-perception of voice also seems to be at least as important for determining voice satisfaction.[11,12,27]

It is important to highlight this point through clinical observation in our own cohort. Even in our homogeneous study group of hormone-naïve trans males, their current voice gender perception was heterogeneous. Their voice-related QOL in general increased as the current voice perception of masculinity increased. Besides, it was seen that this group's future voice desire showed variation among individuals. Three out of 17 people in the study group, despite wanting to receive androgen treatment, were satisfied with their current voice and expected no change. Therefore, when evaluating, it should be kept in mind that these individuals are heterogeneous in terms of both current voice perception and future voice expectations.

Smoking has a negative influence on voice

quality and clarity. Smoking habit was addressed in some studies more prevalent in trans male individuals due to its effect of lowering voice fundamental frequency.[8,12] Van Borsel et al. suggested that trans males have started smoking or increased smoking in order to benefit from this effect.[30] While 14 of 17 participants reported everyday smoking history without a relevant voice altering method history when questioned in detail, the higher smoking rate in our study group is noteworthy, compared to the proportion of individuals who smoke in the Turkish population; 82.4% in our cohort compared to 44.1%, and 14.1% for Turkish men and women, respectively.[31] This association should be also taken into consideration and questioned in detail.

Although the present study adds a major contribution to the available literature, it has several limitations. Our sample size is relatively small. However, as stated by Azul et al.,[11] most of the primary research focusing on the trans males' vocal situation has a sample size of less than 20. On the other hand, although our study group consisted of treatment seeking trans male which does not allow for a generalization of our findings to the general trans male population, it should be taken into consideration that this is the first study to address voice-related gender characteristics of Turkish trans male individuals.

CONCLUSION

Delineating the impact of voice-related concerns on the trans individual's overall QOL is important for determining treatment strategies and evaluating treatment outcomes. It appears that trans male individuals cannot be considered as a homogeneous group in terms of voice gender perception and expectation. Thus, it is necessary to identify their individual needs first. It is also very important to evaluate their current voice-related gender dysphoria. The use of standardized scales such as VHI-10 and V-RQOL in addition to population-specific instruments might provide a more comprehensive approach. Besides, their expectations for voice masculinization should be discussed prior to any treatment.

Considering the heterogeneity evident in our modest cohort, individually tailored management strategies should be established. This was aptly put by WPATH[4] as each person is unique, so is the person's gender identity. In our opinion voice-related gender dysphoria should be evaluated and managed carefully from the very beginning for treatment-seeking trans male individuals using an interdisciplinary holistic approach.

Authors's contributions: *S.S.: study concept and design, data acquisition, data analysis and interpretation, drafting manuscript; A.P.: study design, critical revision of the manuscript for important intellectual content; F.A.: data analysis and interpretation, statistics.*

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