







MULTIDISCIPLINARY EVALUATION IN PATIENTS WITH GENDER DYSPHORIA AFTER MALE-TO-FEMALE SEX REASSIGNMENT SURGERY: COMPARISON BETWEEN PELVIC FLOOR EVOKED SOMATOSENSORY POTENTIALS AND PATIENT GENITAL SENSORY DETECTION EXPERIENCE.

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Declaration of absence of conflicts of interest

Conflicts of interest & Declarations: the authors declare that they have non competing interest.

This study involving human participants was reviewed and approved by the local Azienda Ospedaliera Universitaria Pisana Institutional Ethic Board.

The patients provided their written informed consent to participate in this study.

The work described has been carried out in accordance with the Code of Ethics of the World Medical Association (Declaration of Helsinki) for experiments involving humans and Uniform Requirements for manuscripts submitted to Biomedical Journals.

Funding:

The Tuscany Regional Government has supported the protocol with specific Laws (The analysis of SEP in MtF transsexual people post-GAS as well as psychiatric and psychological investigations are included in the protocol of our University Hospital which is a Referral Center for diagnosis and treatment of Gender Dysphoria).

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Background and Rationale

- ✓ Gender dysphoria is a complex medical condition in which people feel a conflict and an incongruence between their physical or assigned gender and the gender to which they identify (Coleman et al., Int J Transgend 2012; 13: 165 232).
- No robust data are available concerning sexual function, including sensitivity and orgasmic receptivity, in patients with gender dysphoria after male-to-female (MtF) gender affirming surgery (GAS).
- Particularly, the integrity of the neural pathways that link genital sensitive areas to the brain and its correlation with subjective sensations so far have not been explored in detail and remain controversial.

Aims of the study:

- 1 to investigate the sexual health of transsexual people after GAS.
- 2 to evaluate the anatomical and functional integrity of the somatosensory neural pathways of the pelvic floor after the surgery with objective methodologies.
- 3 to look for possible links between objectively assessed genital sensitivity and sexual life quality, defined by subjective tests.

In this study we tested with electrophysiology the integrity of the nervous pathways, after GAS, and explored the relationship between genital sensitivity and self-perceived orgasmic intensity in Male to Female (MtF) patients after GAS.



Materials and Methods

Six patients, afferent to the Center for the Diagnosis and Treatment of Gender Dysphoria at the University Hospital of Pisa, approved with specific Regional (State) Laws, who underwent to GAS between 2016 and 2019 were enrolled in the study and evaluated their genital and pelvic neural pathways.

Age between 30 and 51 years (mean age: 39 ± 9 yrs). All of them were Caucasian, mean BMI was 23.5 kg/m² (range 19-28).

Baseline clinical and laboratory measurement:

- physical examination (Surgeons, Endocrinologist, Psychiatrist, Radiologist, Neurologist and other Health Professionals, Psychologists)
- blood exams
- laboratory endocrinology parameter
- **Hormonal treatment:**
- estradiol in gel and in tablet
- cyproterone acetate as antiandrogen

Genital sensory thresholds (at clitoral, vaginal and anal sites) were investigated by Somatosensory Evoked Potentials of pudendal nerve (pnSEP), performed in parallel with the stimulation of the posterior tibial nerve (ptnSEP) (Opsomer at al., J of Urol, 1986; Murri et al., G It Andrologia, 1994; Pellegrinetti et al., J Neurosci, 2003).

We recorded three main SEP modalities: neoclitoris SEP (ncSEP), neovagina SEP (nvSEP) and inner anal SEP (aSEP) in comparison to posterior tibial nerve (ptnSEP, used as control).

A well-validated psychometric tool, the Orgasmometer, was administered to define the intensity of their orgasm (Cordeau et al., J Sex Med 2014; 11: 1741–1748).



Psycho-pathological evaluation and Sexual Health

Questionnairs of the Tuscany Regional Protocol:

Symptom Checklist (SCL - 90 - R): Cuzzolaro et al., Eating and Weight Disorders: EWD 2006; 11(1), 1–13; Body Uneasiness Test (BUT): Kerckhof et al., J Sex Med 2019; 16: 2018-2029; Female Sexual Functionality Index (FSFI): Vedovo et al., J Urol. 2020; 204(1): 115-120;.

Orgasmometer: doi.org/10.1111/andr.12220.



Fig 2. The Orgasmometer-F. Considering a Likert scale ranging from 0 to 10, where 0 corresponds to the absence of orgasmic perception and 10 to maximum perceived orgasmic intensity, how do you evaluate your orgasmic intensity in the last six months?

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Somatosensory Evoked Potentials (SEPs)



Case n. 3: TdSJP, 35yrs, male to female





Stimulating probe device latex free (Bionen Co, FI, Italy)

Spinal and cortical SEP evoked responses following stimulation of tibial posterior nerve (inset a) and respectively neoclitoris (b), neovagina (c) and inner anal (d) regions. Inside each panel, upper traces represent single trial superimposed; the lower ones grand average; note that for ptnSEP the 4 classical level of recording are showed whereas for pudendal responses only two level of recordings are reported (spinal and cortical).



Results

Domain	Score
Somatization	3.25
Obsessivity-Compulsivity	1
Interpersonal	0.66
hypersensitivity	\frown
Depression	3.6
Anxiety	1.6
Hostility	1.6
Phobic anxiety	1.5
Paranoid ideation	2
Psychoticism	1.3
Global Severity Index	0.3
Positive Symptom Total	20
Positive Symptom Distress	1.23
Index	

Table 1. Averages of SCL-90-R.

Domain	Score		
Global Severity Index – GSI	58.8		
Positive Symptom Total – PST	1.71		
Positive Symptom Distress Index -	33.3		
PSDI	\frown		
Weight Phobia – WP	2.27		
Body Image Concerns – BIC	0.9		
Compulsive Self Monitoring – CSM	0.56		
Depersonalization – D	0.15		

Table 2. Averages for BUT.

Domain	Score		
Libido	3.9		
Sexual arousal	3.85		
Lubrication	2.45		
Orgasm	3		
Satisfaction	37		
Pain	0.9		

Table 3. Averages for FSFI.





 Table 1 - Neurophysiological data: sensory threshold, latencies of Somatosensory Evoked Potentials following stimulation of the tibialis posterior nerve (tpn) and pudendal nerve from neoclitoris, neovagina and endoanal.

Stimulation sites	PT mA	Lumbar	Cortical	ССТ
Tpn Neoclitoris	7.6 <u>±1.9 (6-11)</u> 8.5±2.9 (6-14) ^a	27.2 ± 1.9 (24.7-29.5) 13.0 ± 2.3 (10-16.6)	44.5 <u>+</u> 3.7 (40 -49) 42.6 ± 3.4 (39-48)	17.3 <u>+</u> 3.9 29.5 <u>+</u> 5.1
Neovagina	24.0 <u>+</u> 5.8 (18-31) ^a	15.1 ± 1.8 (12-17)	46.9 ± 4.3 (40-52)	31.8 <u>+</u> 4.2
Endoanal	15.6 <u>+</u> 3.9 (9-23) ^a	12.7 ± 4.2 (7-16)	45.9 ± 2.5 (40-50)	33.1 <u>+</u> 2.7

Data are expressed as mean ± SD; ranges in parentheses; PT = perceptual sensory thresholds; CCT = central conduction times; tpn = tibialis posterior nerve.

a: p<0,05 indicating a statistically significant difference between neoclitoris and neovagina and endoanal; no statistical difference between neovagina and endoanal.





Table II - Correlation between orgasmometer and neurophysiological data foreach stimulation site.

		CLITO RIS			VAGINA			ANAL	
PAT.	ORG	PT	P1	ORG	PT	P1	ORG	PT	P1
1	5	9	47.7	0	19	48.9	5	19	50
2	8	9	39.4	6	28	45.5	1	12	43.8
3	10	14	40.6	2	30	40.9	1	14	47.2
4	7	6	43.9	7	18.5	52.5	5	17	48.9
5	8	6	40.2	8	18	48.1	5	9	45.2
6	5	7	43.6	2	31	45.6	5	23	40.6
MEAN	7.1			4.1			3.6		





Symptom Checklist (SCL – 90 – R)

Higher score for depression and somatization.

Body Uneasiness Test (BUT)

Higher score for the weight phobia; distortion of the body image normal (Body Image Concerns score on average presents a score of 0.9; abnormal if more than 1.2, supporting the importance of the transition) Patients' concern about parts of the body or secondary characteristics typical of the male sex (beard, hair, hands, chest, etc.) is evident.

Female Sexual Functionality Index (FSFI)

Lowest scores occur at the Lubrication and Pain domains; Two patients have never experienced vaginal penetration relationships, but they use other ways of achieving pleasure.

Electrophysiology

SEPs confirmed the peripheral integrity of some afferent sensory spinothalamic pathways from the genital area after GAS. Perceptual Threshold (PT) values were much lower at the neoclitoris compared to neovagina and anal sites. There was no correlation between Orgasmometer and SEP at anal and neovaginal level, while a trend was found at clitoral level.



Conclusions

• Our data show that GAS in MtF transsexual people respects the peripheral integrity of some afferent sensory spinothalamic and above all large-diameter afferent lemniscal neural pathways of the genital area;

• The perceptual thresholds at neoclitoral level are much lower than at vaginal and anal level, seeming to parallel the subjective experience of orgasmic sensation. The same is not true for the other two sites;

• Most of the patients are satisfied with their sexual activity after GAS;

• These findings could lead clinicians to a better understanding of post-surgical sexual life in MtF patients in order to develop surgical techniques that could focus more on functional aspects of neovagina and neoclitoris. SEPs is a good indicator of neural sensitivity, especially in neoclitoris;

• These measurements are consistent with the analysis of self-perceived orgasmic intensity.

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