

# ADOLESCENT TRANSGENDER FEMALES PRESENT IMPAIRED SEMEN QUALITY THAT IS SUITABLE FOR INTRACYTOPLASMIC SPERM INJECTION EVEN BEFORE INITIATING GENDER-AFFIRMING HORMONE TREATMENT

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## INTRODUCTION

The age of individuals seeking treatment for gender affirmation has fallen sharply in recent years and many of them are adolescents. Recent data exhibit impaired semen quality among adult transgender women who preserve fertility before exposure to gender-affirming hormone (GAH) therapy, but little is known about pubertal transgender female adolescents.

Our aim was to determine the semen quality and cryopreservation outcomes among adolescent transgender females at the time of fertility preservation (FP) before initiating GAH treatment.

This retrospective cohort study included 26 adolescent transgender females who underwent FP in our Fertility Institute between 06/2013-10/2020. Pre-freezing semen parameters were compared to WHO 2010 reference values. Post-thaw semen parameters were used to determine the adequate assisted reproductive technology (ART). A multivariate linear regression analysis was performed to assess the impact of medical and lifestyle factors on semen quality.

## RESULTS

The mean age at which adolescent transgender females underwent FP was 16.2±1.38 years.

The median values of all semen parameters in our study group were significantly lower compared to the WHO data, including volume (1.46 ml vs 3.2 ml, respectively, P = 0.001), sperm concentration (28\*10<sup>6</sup>/ml vs 64\*10<sup>6</sup>/ml, P < 0.001), total sperm number (28.2\*10<sup>6</sup> vs 196\*10<sup>6</sup>, P < 0.001), total motility (51.6% vs 62%, P < 0.001), and normal morphology (2% vs 14%, P < 0.001).

The frequency of semen abnormalities was teratozoospermia 72%, hypospermia 52%, oligozoospermia 28% and azoospermia 4%.

The median post-thaw total motile count was 0.17\*10<sup>6</sup>/vial, and the quality was adequate only for ICSI in 87.7% of the thawed semen samples.

No correlation was found between selected medical and lifestyle factors and poor semen parameters.

**Table 1. Clinical parameters of the 25 adolescent transgender females.**

Characteristic	Mean (SD) or Percentage (n) [Standard reference ranges]
Age at the time of GD diagnosis (years)	15.3 (1.97)
Age at the time of first endocrinological consultation (years)	15.9 (1.33)
Age at the time of FP (years)	16.2 (1.38)
BMI (kg/m <sup>2</sup> )	20.7 (4.10)
BMI-SDS	-0.43 (1.46)
Tanner stage	
3	4% (1)
4	4% (1)
5	92% (23)
ASD diagnosis	20% (5)
ADHD diagnosis	16% (4)
History of depression or anxiety	24% (6)
Medication for ADHD	16% (4)
Medication for depression or anxiety	24% (6)
Alcohol	8% (2)
Smoking	8% (2)
Cannabis	24% (6)
Testes tucking	28% (7)
FSH (mIU/mL)	3.93 (3.10) [2.6-11]
LH (mIU/mL)	3.34 (1.83) [0.4-7]
Estradiol (pg/mL)	21.47 (15.64) [10-36]
Testosterone (nmole/L)	18.3 (4.84) [12.13-33.63]
TSH (microIU/mL)	2.30 (1.21) [0.5-4.8]
Prolactin (mIU/mL)	204.34 (74.96) [63.82-382.97]

**Table 2A. Comparison of semen parameters of adolescent transgender females and WHO reference values.**

Sperm parameters	Adolescent transgender females Median (IQR)	WHO reference values Median (IQR)	P value
Abstinence (days)	2.5 (1.5-4.12)	-	-
Volume (ml)	1.46 (0.77-2.78)	3.20 (2.2-4.2)	0.001
Concentration (x10 <sup>6</sup> /ml)	28 (12.67-36.87)	64 (36-100)	< 0.001
Total count (x10 <sup>6</sup> )	28.2 (14.7-107.4)	196 (101-336)	< 0.001
Motility (%)	51.6 (28.33-58.66)	62 (55-70)	< 0.001
Morphology (% normal)	2 (1.33-3.66)	14 (10.5-16)	< 0.001
TMSC (x10 <sup>6</sup> )	14.6 (2.28-51.03)	-	-
Number of collected semen samples per patient	3 (2-3)	-	-
Number of cryovials per patient	10 (7-15)	-	-

**Table 2B. Frequency of semen abnormalities in 25 adolescent transgender females according to WHO reference values.**

Semen abnormality	No. (%)
Hypospermia	13 (52)
Azoospermia	1 (4)
Cryptozoospermia	4 (16)
Oligozoospermia	7 (28)
Teratozoospermia	18 (72)

**Table 2C. Post-thaw semen parameters and cryosensitivity index of adolescent transgender females.**

Sperm parameters	Median (IQR)
Post-thaw sperm motility (%)	16.26 (6.58-22.66)
Post-thaw sperm progressive motility (x10 <sup>6</sup> /ml)	0.35 (0.05-0.83)
Post-thaw TMSC (x10 <sup>6</sup> )*	0.17 (0.025-0.41)
Cryosensitivity index for TMSC (=post-thaw TMSC/pre-freeze TMSC) (%) **	35.7 (26.3-45.5)

## CONCLUSION

Semen quality is strongly reduced among adolescent transgender females before hormone therapy and their stored sperm samples are suitable for intracytoplasmic sperm injection (ICSI) rather than conventional IVF/intrauterine insemination (IUI).