

Differences in Sexual Development: Physical, Psychosocial, and Ethical Issues

Terri Lipman, PhD, CRNP, FAAN
University of Pennsylvania, School of Nursing
Children's Hospital of Philadelphia

1

Conflict of Interest Disclosure

I am a member of the Novo Nordisk Speakers' Bureau

2

How many of you remember these terms?

- Hermaphrodite
- Ambiguous genitalia
- Male/ female pseudohermaphroditism
- Intersex
- Disorders of sexual development

3

- These terms emphasize gonadal anatomy which is neither clinically or socially useful
 - Dreger, et.al, JPEM;18:729-733 (2005)

4

DSD- Definition

- "congenital conditions in which development of chromosomal, gonadal, or [anatomical sex](#) is atypical...may have biological characteristics of both the male and female sexes"

5

DSD- prevalence

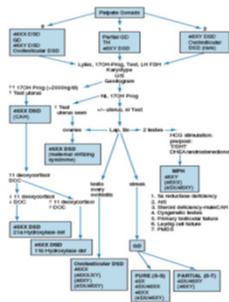
- 1% of live births
- 0.1%-0.2% come to medical attention

6

Most Common Disorders of Sexual Development

- XX DSD
 - CAH- 21-hydroxylase deficiency
- XY DSD
 - Defect in androgen sensitivity (PAIS, CAIS)
 - CAH- 5 alpha reductase deficiency
- Chromosomal DSD
 - Turner Syndrome
 - Klinefelter Syndrome

An algorithmic approach to DSD



From Kolon, Penn Handbook of Urology, 2007

Evaluation of DSD

- History
- Physical Examination
- Imaging
- Laboratory Studies

Only a couple of important items in the history

- Infertility in aunts & uncles
- Hirsutism in females
- Ambiguity in family members
- Maternal exposure to androgens, anabolic steroids, progestins during pregnancy

13

Describe physical findings in sex-neutral terms

- Palpable gonads
- Phallus
 - Size
 - Position of urethral opening
 - Bend, tethering, chordee
- Labioscrotal folds
 - Thinning or rugation
- Perineal orifice
- Symmetry
- Dysmorphic features

14

Diagnostic imaging

- Pelvic ultrasound for uterus, sometimes gonads
- Contrast study of urogenital opening

15

Diagnostic tests

- In nearly all:
 - Karyotype
 - 17-hydroxyprogesterone
 - Testosterone, LH, FSH
- More selectively:
 - Anti mullerian hormone
 - Dihydrotestosterone
 - CAH profile
 - Androgen receptor gene
 - Specific FISH tests

16

Nonstandard genital anatomy

- Small penis or large clitoris?
- Underdeveloped scrotum or overdeveloped labia?
- Anorchia or undescended testes?

17

DSD includes infants with

- Nonstandard genital anatomy- Aphallia
- Abnormalities of internal reproductive structures- Turner Syndrome
- Hormonal abnormalities related to genital development- CAH
- Chromosomal sex not analogous to phenotypic sex- CAIS

18

Ethical issues

- Gender assignment
- Reconstructive surgery
- Clinical decision making

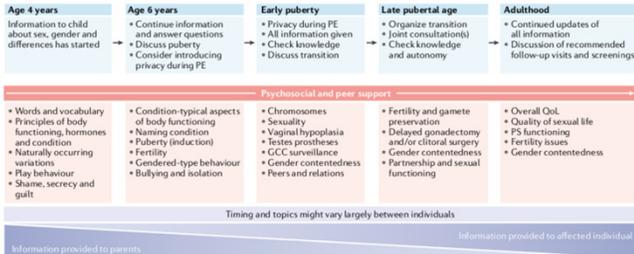
- Modern reconstructive surgery claims that it is possible to create functionally and cosmetically normal-appearing genitalia; however, there is still no consensus regarding indication, timing or procedures of choice
- Such assessments must include documentation of complication rate, functional outcome (micturition (urination) and sexuality), cosmetic outcome, quality of life, psychosexual functioning and, finally, re-evaluation of the indication. Although genital surgery can involve a radical approach to the urinary tract, the effects on urinary function and the pelvic floor (including safe urine storage and drainage, urinary continence and risk of infection) are often insufficiently addressed
-

Current debate

- Is non-urgent genital surgery in infancy ever justified?
- Should parents be allowed to give permission for genital surgery?
- What gender assignment is appropriate for a completely virilized female?

Caring for individuals with a Difference of Sex Development (DSD): a Consensus Statement.

Cools M, Nordenström A, Robeva R, et al
[Nat Rev Endocrinol](#). 2018 Jul;14(7):415-429. doi: 10.1038/s41574-018-0010-8.



DSD: Ethical principles

- Autonomy
- Beneficence/Nonmaleficence
- Truth telling
- Freedom from discrimination
- Medical knowledge
