Condition: 5-ARD DSD

Summary

- XY chromosomes so they produce T at the same level as males.
- 5-ARD is an enzyme that ensures production of DHT hormone.
- DHT hormone ensures development of male external genitalia in the womb.
- Biological males grow up with female genitalia but at puberty, due to T hormone - they develop male characteristics and attraction to females.
- Therefore they are normally raised as females until developing masculine characteristics at puberty due to T.

Condition: PCOS

Summary

- XX chromosome
- Much higher T production, 5 times higher than average female

Claim 1: Play

T levels entirely determine play behavior of prepubescent children. Gendered environment has no role

- See Page 95
- **Hero study**: 5-ARD prefer boy toys vs. unaffected girls despite being raised in same gendered environment
    - Though not as much as unaffected boys so maybe there is still some gendered contribution? The author does not address this.

Not entirely convinced, I'm in the both contribute camp.

Claim 2: Performance

High T levels in women athletes give a competitive advantage in most sports

I think the evidence is convincing here though it doesn't address the question whether they should be barred from women's sports (the author rightly points out that is out of scope of science).

- See Page 125
- **Hero Study 1:** 5-ARD whose T levels are as high as males are overrepresented 137 times
- **Hero Study 2:** PCOS whose T levels are 5 times higher than average female are overrepresented 36 times
- Even lowering T levels doesn't fully equalize as irreversible benefits are gained during puberty due to high T levels.
    - NEED to go through the claims systematically though.

Claim 3: Aggression

High T levels lead to more reactive aggressive behavior in men ... with (lots of) caveats

Hero Study: Aggression levels when playing a game designed to measure aggression levels ("Point Subtraction Aggression - PSAP). T and placebo were provided using a nasal spray and then they played the game.

The author also seems to acknowledge that there are other studies which showed NO effect but briefly argues it away by stating that most likely due to small sample sizes (which would mean the effect size is small?)

The caveats being that

1. Men must also have a "lack of control" (not elaborated on how that is biologically determined, I assume genetic)
2. Must have highly sensitive androgen receptors (genetic)
3. Must have highly efficient process to convert T into other androgens (genetic)
4. Reduces empathy (not elaborated on the mechanism)

A lot more details needed to tease out of the modulating factors of T and aggressive behavior. The author argues that this does not mean the link is weak but rather that the details are missing - to come with more research.

To me, it actually seems .. weak. But I'll keep an open mind on this until more details are forthcoming.

Claim 4: Libido & Novelty

Increase/decreases in libido sexual novelty are due to corresponding increases/decreases in T

- Page 196
- Hero Studies all seem to be for cases where levels go from very low to high and reverse
- Range bound levels are not addressed

No evidence linking low levels of T in women to low libido

- Page 199 & 200
- Hero Study 1: Low libido is not associated with low T levels.
- Hero Study 2: Increasing T levels either has no effect or small effect on libido

Claim 5: Orientation

No evidence so far that T has any effect on orientation in men & weak evidence that it has on women

- Page 206-207
- Hero study 1: Since it is almost impossible to monitor prenatal T levels of pregnant women, index-ring finger ratio (which correlates with prenatal T level exposure) is a noisy proxy and shows no association with orientation.
- Hero study 2: For women, some studies show no effect while some show small effect (but it could be due to publication bias).