The effects of hormonal manipulation in children, teenagers and adolescents with gender dysphoria

Puberty blockers and cross sex hormones

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Puberty blockers (PB)

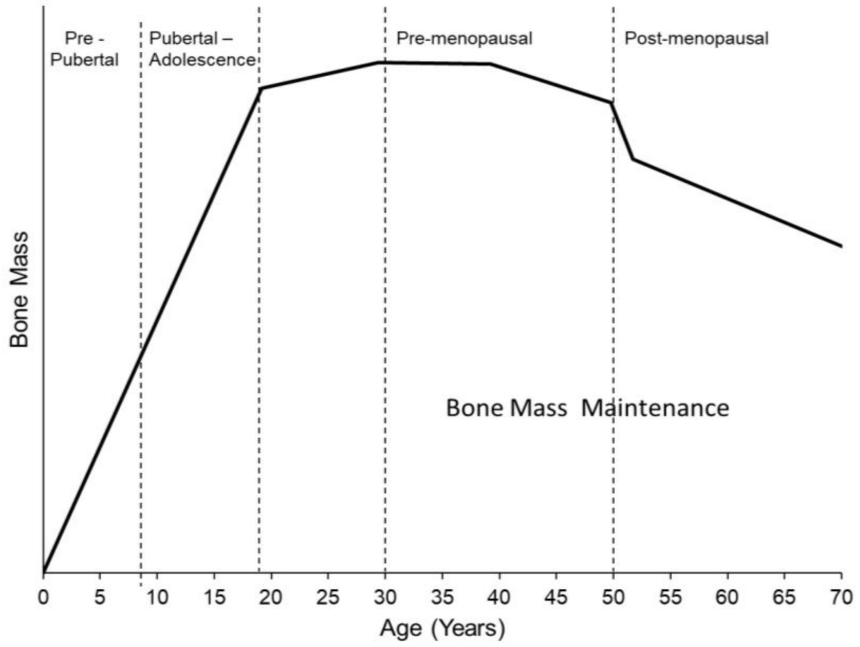
- PB are **gonadotropin-releasing hormone agonists (GNRHa)**
  - They attach to the GNRH receptors in the pituitary and down regulate a complex hormonal feed-back-system that results in a decreased production and thereby effects of the sex hormones and the human growth hormone.
- GnRHa have never been licensed for treating children suffering from gender dysphoria (GD).
- They are licensed to treat
  - prostate cancer
  - endometriosis and uterine fibroids in women (for no longer than six months)
  - and precocious puberty in children
- In the case of GD, the effects of puberty blockers are claimed to be totally reversible and act as a mere pause-button to give a child and its family time to think and decide on the next steps.
  - Almost 100% of children that start PB treatment continue to cross-sex hormones.[1-3]
  - Hence, the use of PB can be considered the first step on the path to life-long medicalization.

Manifestatin of puberty

- The adolescent growth spurt; Rapid increase in bone density. Enlargment of internal organs.
- The development of the gonads (testis and ovaries).
- The development of the secondary reproductive organs and the secondary sex characters.
- Changes in body composition
- Development of the circulatory and respiratory systems leading, particularly in boys, to an increase in strength and endurance.
- Puberty represents a period of profound transition in terms of drives, emotions, motivations, psychology and social life.
  - The neurological and psychological changes occurring in puberty are less well understood than the physiological changes.

The effects/adverse effects of puberty blockers

- Bone development:
  - Growth spurt and bone mineralization/density
    - Up to 90% of peak bone mass is acquired by age 18 in girls and by age 20 in boys, which makes youth the best time to “invest” in one’s bone health.
    - Significant risk for osteoporosis. [4-7]



The effects/adverse effects of puberty blockers

- Development of the gonads
  - Blocking the maturation and development of the gonads and then going directly over to cross sex hormones will lead to infertility. [7-10]
- Genital growth and development.
  - Sexual dysfunction. [7-9]
  - Problems with future sex reassignment surgeries.[7-9]

The effects/adverse effects of puberty blockers

- Brain development.
  - Many unanswered questions
  - Research have shown various negative effects on cognitive function. [11-14]
- Listed side effects of GNRHa
  - hot flashes, fatigue, weight gain, fluid retention, decreased libido, headaches, mood swings, vaginal dryness, decreased breast size, increased breast size, acne, muscle pains, dizziness, depression.
    - Side Effects of Lupron (Leuprolide Acetate Injection), Warnings, Uses (rxlist.com)
    - Triptorelin Uses, Side Effects & Warnings - Drugs.com

Cross-sex hormones

- Studies have shown that 95-100% of children treated with PB continue to cross-sex hormones.[1-3]
- Majority of trans-identifying youth presenting for treatment today are experiencing post pubescent onset of GD so most enter the medical treatment pathway at the cross-sex hormone stage.
- Testosterone for biological females and estrogen and testosterone blocking agents for biological males.

Cross-sex hormones

- Cross-sex hormone (CSH) administration rapidly induces irreversible changes: clitoral growth, deepening voice and hirsutism (abnormal hair growth on the face and torso) in females, and gynecomastia (abnormal growth of breast tissue) in males
- The long-term effects of hormonal manipulation extents far beyond superficial changes in appearance
  - They create serious, well documented risks of increased morbidity and mortality

Cross-sex hormones

- Estrogen:
  - Estrogen products have a mandatory warning label due to increased risks of: heart attack, stroke, blood clots and cancer. [15]
  - Males taking estrogen have a five-fold risk of forming blood clots and significantly increased risk of ischemic stroke [16-17]
  - Liver problems have been observed
    - Jaundice, hepatitis and fulminant liver failure [18]
  - Some of the greatest risks do not become apparent until after several years
    - For example, in natal males on estrogen, the risk of blood clots spikes around the 7th year into treatment [16]

Cross-sex hormones

- Testosterone
  - Is classified as a humancarcinogen agent class 2A and is a known teratogenic agent. [19]
  - In 2016 FDA put out a warning label regarding dependency risk.[20]
    - Warning will alert prescribers to the abuse potential of testosterone and the serious adverse outcomes, especially those related to heart and mental health that have been reported in association with testosterone.
  - Research suggests that females taking testosterone develop hypertension and have a nearly three-fold increase in myocardial infarction as well as a heightened risk for malignancy, stroke and liver problems. [16-18,21-23]
  - Females on testosterone can experience severe uterine pain and vaginal atrophy
    - Sometimes hysterectomy is preformed to alleviate the pain. [24-25]

To summarize

- PB are not licenesed to treat children with GD
  - All usage is off label
- Treatment with PB can lead to decreased bone density (osteoporosis), infertility, sexual dysfunction and negative effects on cognitive function
- Almost 100% of children that are put on PB go on to take cross sex hormones [1-3]
- Cross sex hormones rapidly induce irreversible changes to the body
- In long term cross sex hormones create serious, well documented risks of increased morbidity and mortality [15-25]

Thank you for listening!!

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