DELAYED PUBERTY

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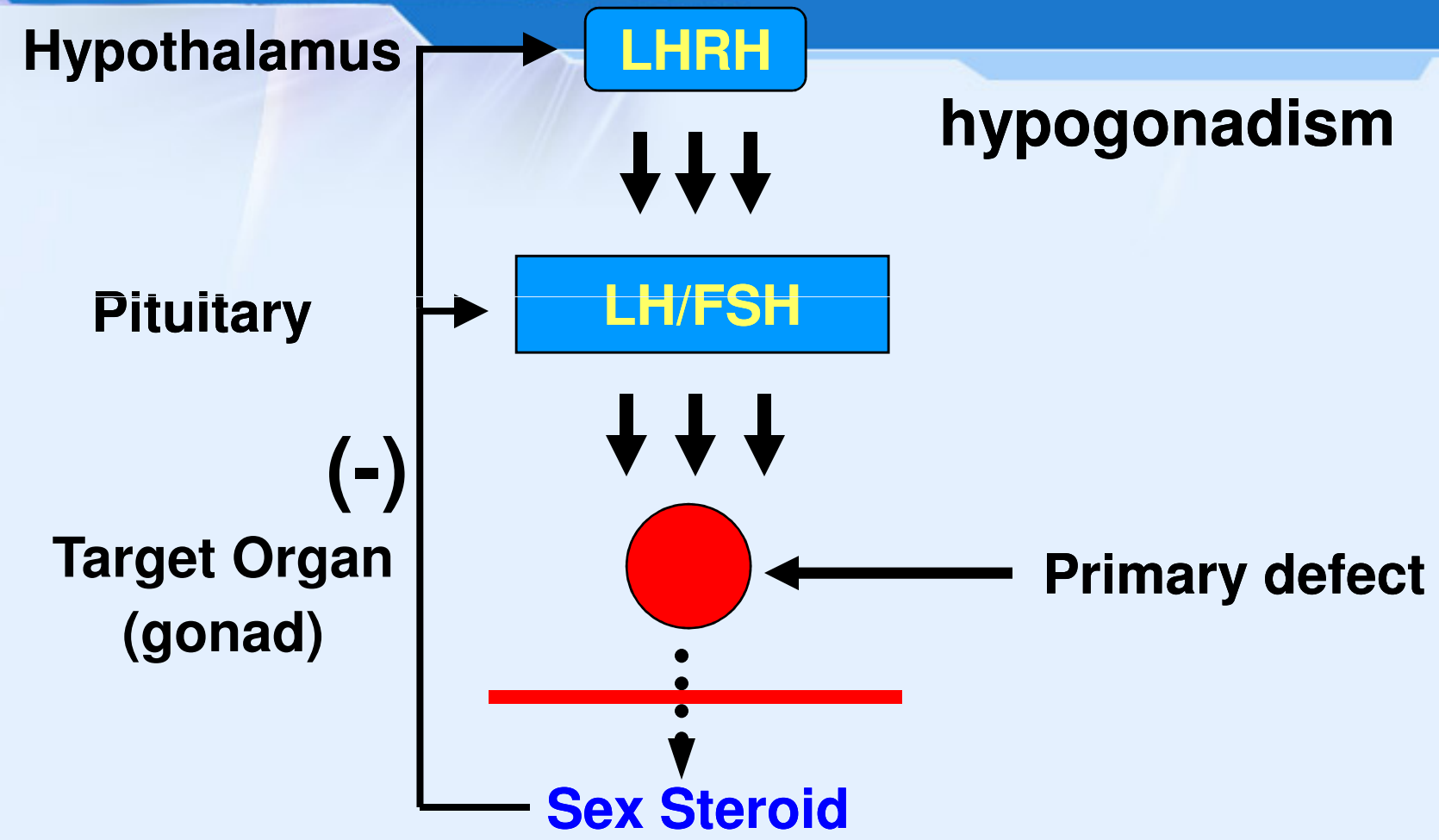
Defenition

- Delayed puberty if puberty signs are absent :
  - **Male : 14 yrs old**
  - **Female : 13 yrs old**
- Classification
  - **hypergonadotrophic hypogonadism**
  - **hypogonadotrophic hypogonadism**

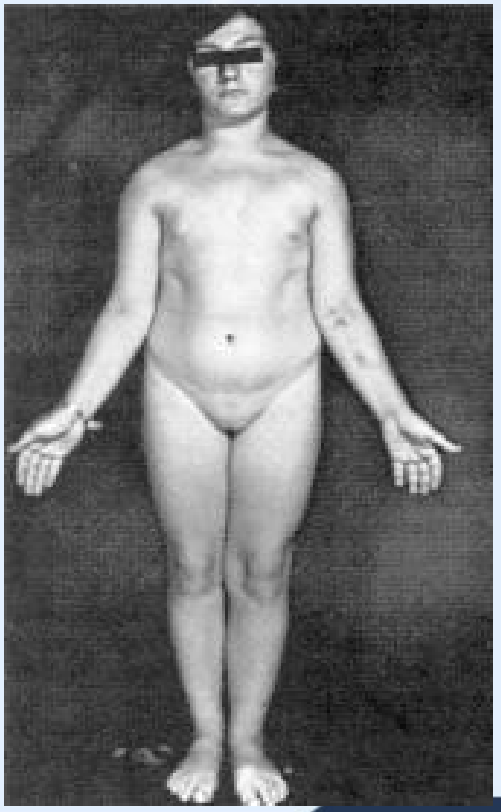
hypergonadotrophic



Hypergonadotrophic hypogonadism

- **With chromosomal disorder**
  - **Dysgenesis gonad**
    - Sindrom Turner
    - *Pure gonadal dysgenesis*
  - **Sindrom Klinefelter**
  - ***Androgen Insensitivity Syndrome ****

Turner Syndrome

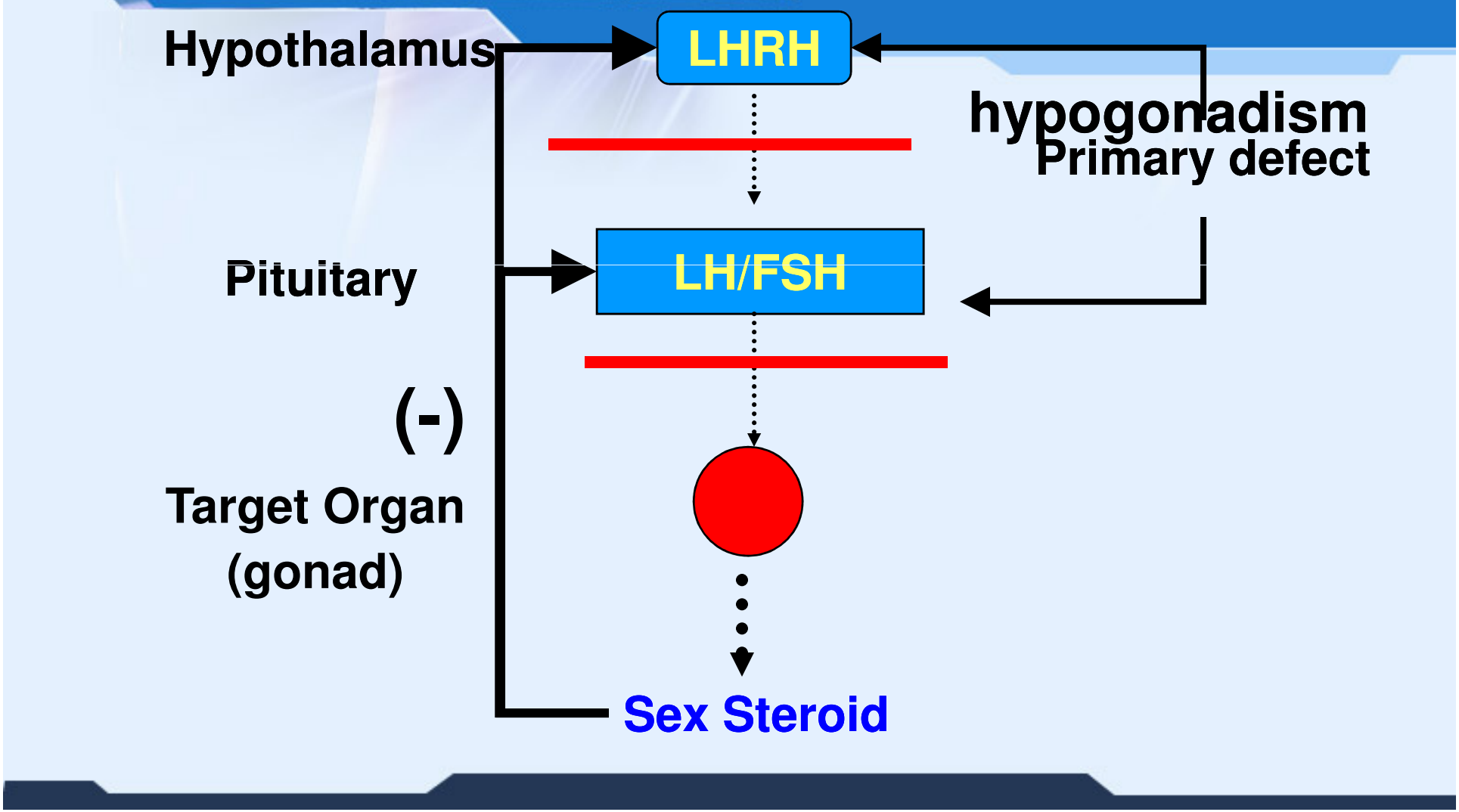


- 45,XO, mosaic (45,XO/46,XX etc)
- 1:2500 live birth (E)
- dismorphic : web neck, shield chest, heart disorder etc
- Main complaint: puberty and growth disorders (final height 142 cm)

Hypergonadotrophic hypogonadism

- **Without chromosomal disorder**
  - **congenital**
    - adrenal steroid biosynthesis disorder (P450c17,P450scc,3βHSD) and gonad (17-KS, P450 aromatase)
    - anorchia, *ovary resistant syndrome, LH resistance*
  - **acquired**
    - radiation, chemotherapy, autoimune process

Hypogonadotrophic



Hypogonadotrophic hypogonadism

- **Constitutional delay** (frequent etiology of delayed puberty)
- **CNS disorders**
  - **Tumor (craniopharyngioma, germinoma, optic glioma, histiocytosis X)**
  - **Structural (*mid line defect*)**
  - **Kallmann syndrome**
  - **hypopituitarism idiopathic**
  - **post radiation, chemoterapy inflamation, infiltration - hemosiderosis)**

Hypogonadotrophic hypogonadism

- **Chronic**
  - **endocrine, malnutrition/anorexia nervosa, systemic disorder**
- **Excessive physical activity**
- **Sindromes**

  Prader-Willi; Laurence-Moon-Biedl

Management

- History
- Physical examination
- Work up
- Therapy

History

- Family history of delayed puberty
- Growth and development data
- Previous disease and treatment
- Smelling function

Physical examination

- general Physical examination
- Neurologic examination (funduscopy)
- Antropometric (height, weight, upper and lower extremity ratio, rentang arm span)
- puberty stage
- Syndrome's characteristic (shoeth, obesity, mental retardation, *webbed neck* etc)

Work up

- **Imaging**:
  - **Bone age, head CT scan/MRI & internal genital USG (atas indikasi),**
- **Hormonal** (basal/ GnRH test)
  - **LH,FSH,Prolactin, Estrogen or testosterone**
- **Etc**
  - **chromosomal analysis (based on indication)**
  - **Smell function test**

Therapy

- **Based on etiology : thallasemia**
- **puberty induction**
  - **Sex steroid (testosteron, estrogen)**
  - *gradual* **:**
    - Follow natural puberty development
    - Prevent early epiphiseal closure
- **fertility induction**

Conclusion

- Mostly normal (constitutional delay of growth and puberty)
- Infertility etiology
- Puberty induction must be done gradually

THANK YOU