Kallman Syndrome

Kallman syndrome, or hypogonadotropic hypogonadism, is a genetic disorder leading to failure to start or complete puberty. This occurs because of defective migration of GnRH releasing-neurons to the hypothalamus, leading to hypogonadism. Patients display anosmia, delayed puberty and infertility.



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Mutation in KAL-1 or FGFR-1 Gene

Mutant who Calls-1 for FroG-Firefighter-(1) Wand

Though most cases of this disorder have an unknown origin, there is evidence that FGFR-1 (fibroblast growth factor receptor 1) and KAL1 gene defects can lead to Kallman Syndrome. These genes help normal migration of GnRH neurons into the hypothalamus.

Failure of GnRH Secreting Neurons

Failure of Gonad-gopher Nerve Secretion

This syndrome occurs from defective migration of GnRH releasing neurons to the hypothalamus. This leads to decreased synthesis and release of GnRH in the hypothalamus, leading to decreased gonadotropin release.

Delayed Puberty

Delayed Pubescent-teen

Due to low serum testosterone and gonadotropins, LH and FSH, patients can show delayed puberty. This can also manifest as incomplete puberty, which is also a cause of hypogonadotropic hypogonadism.

Anosmia

Broken A-nose

Anosmia occurs because normal GnRH neurons originate in the olfacory placode, pass through the olfactory bulb to the hypothalamus. If there is a neuron migration issue, where this path is no longer taken, the patient's smell becomes defective because of olfactory bulb development issues.

Hypogonadism

Hippo-gonads

Due to improper migration of GnRH releasing cells, hypogonadism occurs. Patients have low levels of FSH, LH and resultingly, testosterone and estrogen.

Infertility

Infertile-plant

Due to hormone abnormalities, adult patients are often infertile. Males can show low sperm counts, while many females will present with amenorrhea.

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