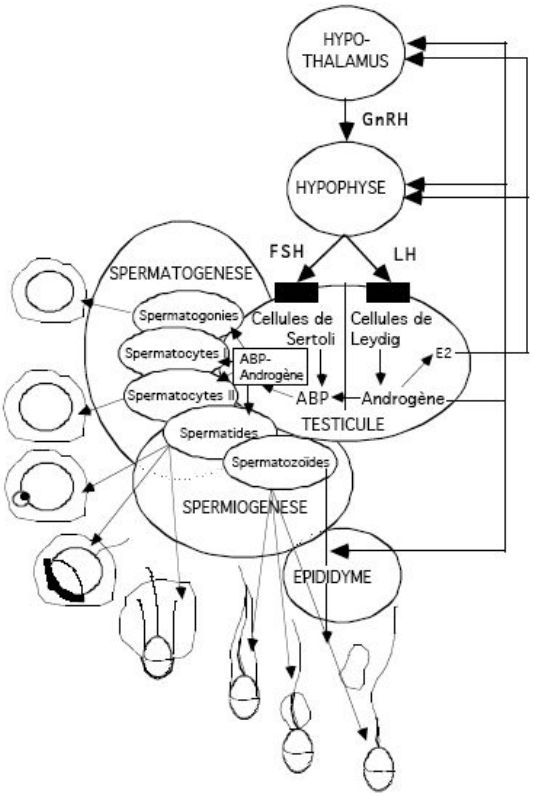
002: Introduction on semen analysis

This chapter brings together a set of theoretical notions, but also a practical description of procedures employed to analyse a semen sample and the biomedical interpretation of the measured values.

The basic semen analysis is a collection of macroscopic and microscopic observations to determine whether semen has normal characteristics. The World Health Organization (WHO, 1987) has published a set of standardized procedures. The semen analysis is part of the basic examinations that the requesting doctor uses to establish a report of infertility of torque. Its correct interpretation can only be done taking into account other variables, such as the type of infertility (primary, secondary), its duration, and possibly associated female and male pathologies (tubal examination, endocrine assessment, clinical examination). The fact that the parameters of the semen analysis undergo large fluctuations in the short, medium and long term in the same individual complicates singularly the formulation of a prognosis on the fertilizing capacities of an individual.



The differentiation of spermatozoa into a cell capable of fertilizing the human oocyte (Figure 1) is a long process (72 days) that is regulated by the secretion of pituitary gonadotrophic hormones (FSH, LH). Stimulation of spermatogenesis by exogenous administration of commercial gonadotropin preparations (hMG or hCG) induces no improvement in semen analysis values in oligozoospermic patients (Clark and Sherins, 1989, Knoth et al., 1987). except for those with hypogonadotrophic hypogonadism (Vantman et al., 1989, Burris et al., 1988, Bellve and Zheng, 1989). Similarly, pituitary stimulation with pulsed GnRH (iv or intranasal) does not significantly increase semen analysis values or the ratio of FSH bioactive / FSH immunoreactive (Crottaz et al., 1992). Since most oligozoospermic patients have baseline LH, testosterone (T), and normal T / LH levels (Giaguli and Vermeulen, 1988), but varying levels of FSH, it has been suggested that the latter, by action on Sertoli cells, was the main regulating hormone of spermatogenesis (Bremner et al., 1984).

In view of the lack of adequate cure for deficient spermatogenesis, the treatment of male infertility is a major challenge both biologically and medically. From a public health cost reduction perspective, it is essential that the seminal analyzes can quickly guide the requesting physician on the optimal therapeutic proposals he can offer to infertile couples. Based on the results obtained in in vitro fertilization, we developed a sperm analysis strategy aimed at assessing more accurately the fertilizing properties of a sperm sample. This strategy involves more elaborate procedures, defined as optional by the WHO, such as the selection of motile sperm (sperm washing), the use of strict criteria for the determination of the level of normal forms, the immunofluorescence analysis of the spermatozoa. main proteins involved in fertilization (acrosin and tubulin) and the objective measurement of the kinetic characteristics of the movement of spermatozoa. These complementary analyzes lead to the formulation of a treatment proposal that the requesting doctor can then discuss with the couple. This approach has the advantage of removing interpretation ambiguities, confusing the couple treated, and

rationalizing the implementation of expensive therapeutic interventions such as artificial insemination and fertilization in vitro.

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