



The ovulatory phase is a pivotal period of the menstrual cycle, marking the transition between the follicular and luteal phases. It corresponds to the time of ovulation, that is, the release of a mature oocyte by the dominant follicle, ready to be fertilized by a spermatozoid. The ovulatory phase lasts about 24 to 48 hours and usually occurs on the 14th day of a 28-day cycle, but can vary depending on the length of the follicular phase.

The triggering of ovulation is under the control of the hypothalamo-pituitary-ovarian axis, as described in sub-module 1.8. At the end of the follicular phase, the progressive increase in estradiol levels secreted by the dominant follicle exerts a positive feedback on the hypothalamus and pituitary, stimulating the release of a LH peak. This ovulatory LH peak, which can reach 10 to 20 times the baseline values, is essential to induce the final stages of oocyte maturation and follicle rupture.

Under the effect of the LH peak, the oocyte completes its first meiotic division and expels the first polar body, thus becoming a haploid secondary oocyte. It then resumes its second meiotic division, but remains blocked in metaphase II until possible fertilization. Simultaneously, the LH peak induces morphological and biochemical changes in the follicular cells, which secrete proteolytic enzymes (collagenases, plasmin) responsible for the digestion of the follicular wall and the expulsion of the oocyte.

About 24 to 36 hours after the LH peak, the mature oocyte is released into the peritoneal cavity, surrounded by the corona radiata and the cumulus oophorus. It is quickly captured by the fimbria of the Fallopian tube, thanks to the movements of the fringes and the liquid currents created by the cilia of the tubal epithelium. The oocyte then begins its migration in the tube, where it can be fertilized by a spermatozoid if there has been sexual intercourse in the days leading up to or following ovulation.

The ovulatory phase is accompanied by several physiological changes that can help identify the fertile period of the cycle. The most well-known is the modification of the cervical mucus, which becomes abundant, clear, stretchy and slippery under the effect of estrogens, thus facilitating the passage of spermatozooids through the uterine cervix. Some women also experience unilateral pelvic pain (mittelschmerz) at the time of ovulation, due to the irritation of the peritoneum by the follicular fluid and enzymes released during follicle rupture.

Detection of ovulation can be done by various methods, such as urinary tests that detect the LH peak, temperature curves that highlight the post-ovulatory thermal elevation, or pelvic ultrasound that visualizes follicular rupture. These methods are used in the context of infertility assessment or assisted reproduction protocols to optimize the timing of sexual intercourse or intrauterine insemination.

After ovulation, the ruptured follicle turns into a corpus luteum under the effect of LH, and begins to secrete progesterone to prepare the endometrium for possible embryonic implantation, as described in sub-module 1.9. Progesterone secretion by the corpus luteum also exerts a negative feedback on the hypothalamo-pituitary axis, inhibiting the secretion of GnRH and LH and preventing the recruitment of new follicles during the luteal phase.

In some women, ovulation can be disturbed or absent, which is known as anovulation. The causes of anovulation are multiple and can be central (hypothalamic-pituitary disorders), ovarian (premature ovarian failure, polycystic ovary syndrome) or peripheral (hyperprolactinemia, hyperandrogenism). Anovulation is a common cause of infertility and may require specific management, such as ovulation induction by clomifene citrate or gonadotrophins.

In conclusion, the ovulatory phase is a key event of the menstrual cycle, allowing the release of a fertilizable oocyte and marking the beginning of the luteal phase. Understanding it is essential to grasp the mechanisms of human reproduction and optimize the chances of conception. The methods of detecting ovulation and the treatments for anovulation are valuable tools for managing female fertility disorders.

Key points to remember:

- The ovulatory phase is a pivotal period of the menstrual cycle, which lasts about 24 to 48 hours and corresponds to the release of a mature oocyte by the dominant follicle.
- The triggering of ovulation is under the control of the hypothalamo-pituitary-ovarian axis, and is induced by an LH peak at the end of the follicular phase, stimulated by the increase in estradiol levels secreted by the dominant follicle.

- Under the effect of the LH peak, the oocyte completes its maturation and is expelled from the follicle, then captured by the fimbria of the Fallopian tube where it may be fertilized.
- The ovulatory phase is accompanied by physiological changes, such as the modification of the cervical mucus and sometimes by pelvic pain (mittelschmerz).
- Detection of ovulation can be achieved by various methods (urinary tests, temperature curves, ultrasound) and is used in the context of infertility assessment or assisted reproduction protocols.
- After ovulation, the ruptured follicle turns into a corpus luteum and secretes progesterone, exerting a negative feedback on the hypothalamo-pituitary axis.
- Anovulation is a common cause of infertility and may require specific management, such as ovulation induction by clomifene citrate or gonadotrophins.