

6 Fertility Treatment and Pregnancy—Reproductive Medicine and TCM in Meaningful Cooperation

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■ Introduction

When we consider the modern options of reproductive medicine in the holistic care of couples, the question arises whether Western scientific medicine and TCM might not be able to complement and approach each other with regard to the different medical theories underlying both systems. By now, solid scientific studies exist that indicate the successful results of such cooperation. The necessity of combining biomedical reproductive medicine and TCM makes sense even on the most basic level since the principle of individualized treatment in TCM complements the normative approach of biomedical treatment.

The following paragraphs therefore shed light on the one hand on those areas where the strengths and therefore indications of the biomedical approach are situated, and on the other hand on those areas where TCM offers advantages to couples in regard to diagnosis and treatment of reproductive disorders.

Requirements for a Successful Pregnancy

The goal of a successful pregnancy requires a whole series of preliminary conditions:

- in the woman
- in the man
- during conception
- during implantation

Requirements in the Woman

In biomedicine, the “quality” of the gametes (reproductive cells with half the set of chromosomes) is seen as being of paramount significance. We now know that a hormonal disturbance with an

elevated level of male sex hormones (hyperandrogenism, often so-called polycystic ovary syndrome [PCOS]) in women drastically reduces the quality of eggs and therefore the likelihood of pregnancy. Such hormonal disturbance is partly related to the patient's state of being considerably overweight. The quality of a woman's eggs is furthermore limited—as we know well—particularly by increasing age. The loss of quality is primarily because a woman's supply of eggs is limited. This supply peaks during the woman's own fetal stage. At the time of birth, it consists of approximately 500 000 primordial follicles (immature egg cells in the ovaries). With the exception of the 400–500 oocytes that reach ovulation during the course of a woman's fertile years, all others will spontaneously perish throughout her life. Furthermore, the development from primordial follicle to pre-ovulatory follicle takes almost a year (see **Fig. 6.1**); it is only in approximately the last 4 weeks before ovulation itself that the follicle is controlled by hormones via the female cycle.²⁹

In a process called meiosis (reduction division of reproductive cells), the set of chromosomes in the cells is cut in half, into a single chromosome set. It is significant here that the oocytes remain arrested in this so-called first meiotic division during the entire time (longest period of cell division in humans up to ca. 50 years). This makes the oocytes particularly susceptible to damaging factors such as:

- nutritional state in the ovaries
- effect of cellular and environmental toxins
- nicotine abuse
- bodyweight
- ionizing radiation

As such, the rate of aneuploidy in oocytes increases with advancing age (> 50% of oocytes). As we know today, genetic disposition is also particularly significant in that it determines the number of initiated oocytes in the ovaries and influences the spontaneous decrease of eggs in the course of the woman's life. Additional factors that affect egg

quality in women from a biomedical perspective are inflammations of the ovaries or autoimmune diseases (thyroid glands, the so-called antiphospholipid syndrome, autoimmune disorders, hereditary coagulation disorders).

In this short and obviously incomplete presentation of biomedical notions regarding the significance of oocyte quality, we can already see the importance of bodyweight (especially at the time of puberty!) and lifestyle. In this context, TCM and biomedical strategies can be used together preventatively, in which case TCM surely offers more varied and individual treatment concepts: from lifestyle advice, nutritional therapy, and *qi gong* to medicinal therapy, a multiplicity of options exist for influencing gamete quality and quantity.

Requirements in the Man

For the man, the situation is more complicated. We know today that excess weight and smoking have a considerable influence on sperm quality. In addition, biomedicine recognizes a multitude of factors that are said with more or less certainty to contribute to a decrease in semen quality. For some of these factors, the influence on sperm quality is only temporary; hence it makes sense to have a control spermogram done after a so-called completed sperm cycle of 3 months or possibly even later (e. g., in cases of low sperm quality due to anabolic therapy related to bodybuilding). It has become apparent that spermiogenesis is characterized by considerable inter-individual sensitiv-

ities that may be genetically determined. There is also a connection here to undescended testes as a cause of reduced sperm cell formation (testicular dysgenesis). Biomedicine recognizes that after puberty, viral infections in particular can gravely affect spermiogenesis, with a possible complete destruction of the sperm-forming tissue. Many of these different factors have in common that they ultimately harm spermiogenesis by elevating the level of extra- and intracellular free oxygen radicals and can thereby even trigger point mutations. Biomedicine attempts to counteract this action with high dosages of vitamin E and zinc. In this area, TCM also offers options.

For successful fertilization, the ratio between egg cells and sperm cells is also decisive. At the site of natural fertilization, namely the ampulla of the fallopian tubes, an estimated ratio of one ovum (still encapsulated by the surrounding tissue) (Fig. 6.1) and ca. 100 000–150 000 motile spermatozoa is needed. It is only in the woman's inner genitalia that the spermatozoa reach their full functionality, that is, the penetration of the surrounding tissue to reach the ovum itself, the penetration of the zona pellucida that encases the ovum, and the fusion of the cell membranes of the sperm and egg. This process is called capacitation. Success is possible only for quickly moving and normally formed spermatozoa. We can assume a normal probability of fertilization when a man's sperms exceed the minimum values (Table 6.1).

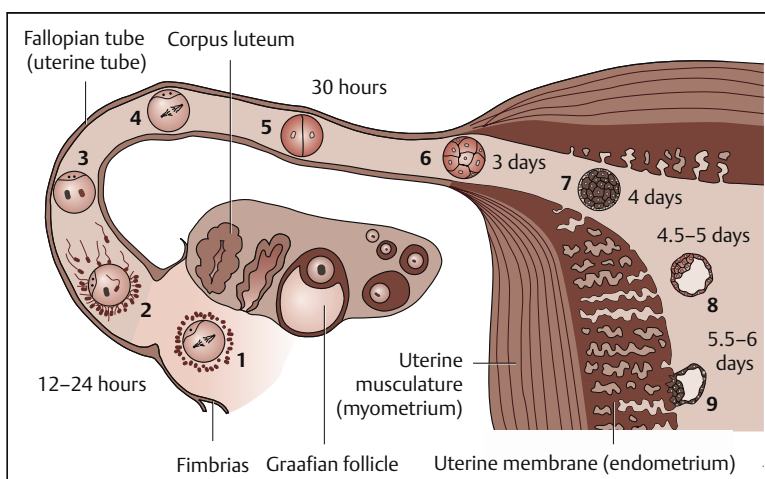


Fig. 6.1 Fertilization, fallopian tube transport, and implantation. Schematic presentation of the developmental processes in humans in the first week: 1 ovum directly after ovulation; 2 fertilization within 12–24 hours; 3 stage with male and female pronucleus; 4 zygote, 1st cleavage; 5 two-cell stage; 6 morula stage; 7 entry into the uterine cavity; 8 blastocyst with blastocyst cavity; 9 early stage of nidation (implantation).