Chapter 12

MALE INFERTILITY AND TREATMENT WITH ASSISTED REPRODUCTIVE TECHNIQUES

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Introduction

There have been many years of research about gender formation, the process of development of infants in the womb, and sex chromosomes which are object of curiosity for humans. Various theories have been produced in this subject. At early 20th century, when it became clear that sex chromosomes play a key role, this subject reached enlightenment. Thus, many ideas about this issue were disproved.

Sex formation process is a difficult and complex stage. It can occur as healthy if successive processes proceed smoothly. Problems that may arise from a disruption in the process can cause infertility.

Sex Cells Formation in Humans

Sex- specific, different characteristics develop both in women and men. The most obvious of this is the presence of eggs in women and the presence of sperms in men. These cells are generally called "gamet" and they are produced in gonads. Gamet producing process is called gametogenesis and has 4 steps:

1. Outer embryonic origin of sex cells and migration of these cells to gonads
2. Increase the number of sex cells through mitosis
3. Reduction of chromosomal numbers of sex cells by meiosis
4. Structural and functional maturation of sex cells

Although first step is observed both in women and men, there is sex-specific differences in other 3 steps.

Origin of sex cells and migration

The earliest forms of gametes in the embryonic process are called primordial germ cells (PGC). These cells first form outside the gonads and then migrate to the gonads to form sex cells. If primordial germ cells migrate to other stages where are expect the gonads, they will usually die. However, in the case of life, they develop as teratoma (Figure 1). Teratomas are amorphous structures containing differentiated tissues such as hair, skin, teeth, cartilage.

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Although ICSI spreads on worldwide in last years, only last period there are possible risks because of random using of ICSI. These worries especially have recently emerged as result of recen advances in genetically determined male infertility.

ICSI is more fearful for emerging offspring in transmiting genetic anomalies than other forms of supporting reproduction techniques. Because an active spermatozoon which is necessary to begins all mechanism for oocyte penetration and to be exposed normal capacitation and acrosome reaction skips all physiological steps associated with fertilization. With skipping of these steps ICSI allows egg fertilization by a modified spermatozoon. Thus risk of genetic damage will increase in the offspring.

Mulhall and colleague are reported first time that fertilization and pregnancy are obtained by using ICSI with testicular spermatozoon from azoospermic patients which have deletion on DAZ region. This case is demonstrated that spermatozoon which carries deleted Y chromosome are completely effective on fertilization.

After that the same group are reported that birth of male children via ICSI from a male which has AZF deletion and also other workers are obtained the same results at the end of their studies. Following the Mendel possibilities, all of male childrens are herited Y chromosome which has deletion.

In vitro fertilization (IVF) is a technique based on artifical fertilization of an egg by sperm under the in vitro conditions.

IVF is an important therapy method when other therapy metods are failed. Briefly IVF procudure includes; to follow the spawning period of a female, to obtain egg from the ovary and to fertilize this egg with a sperm in in vitro conditions in the laboratory environment and to transfer the zygote which is a fertilized egg for a successful pregnancy in the uterus.

Spermatozoon with deleted Y chromosome also transmits deletions to male childrens via IVF. In fact this case indicates that the spermatozoon obtained from an oligozoospermic subject which carries deletion on long arm can fertilize oocyte in in vitro conditions.

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