29.18B: Infertility

Infertility, in both males and females, refers to the inability to contribute to conception.

Learning Objectives

- Evaluate the factors involved in infertility

Key Points

- Several clinical and epidemiological guidelines exist to determine infertility, often based on regular sexual intercourse in the absence of contraception without conception.
- Infertility can result from genetic factors or more general factors such as endocrine disorders (diabetes, thyroid disorders, etc.) and environmental factors.
- In the U.S., up to 20% of infertile couples have unexplained infertility. In these cases abnormalities are likely to be present but not detected by current methods.
- Medical treatment of infertility generally involves the use of fertility medication, medical device, surgery, or intrauterine insemination. If these treatments fail to achieve a full term pregnancy, in vitro fertilization or other assisted reproductive techniques (ART) can be used.

Key Terms

- **contraception**: The use of a device or procedure to prevent conception as a result of sexual activity.
- **infertility**: The inability to conceive children.
- **conception**: The fertilization of an ovum by a sperm to form a zygote.
Infertility primarily refers to the biological inability of a person to contribute to conception. Infertility may also refer to the state of a woman who is unable to carry a pregnancy to full term. There are many biological causes of infertility, some of which may be bypassed with medical intervention.

Definitions of infertility differ, with demographers tending to define infertility as childlessness in a population of women of reproductive age, while the epidemiological definition is based on “trying for” or “time to” a pregnancy, generally in a population of women exposed to a probability of conception. Existing definitions of infertility lack uniformity, rendering comparisons in prevalence between countries or over time problematic, and therefore data estimating the prevalence of infertility cited by various sources differs significantly. A couple that has tried unsuccessfully to have a child after a certain period of time (often a short period, but definitions vary) is sometimes said to be subfertile, meaning less fertile than a typical couple. Both infertility and subfertility are defined as the inability to conceive after a certain period of time (the length of which vary), so often the two terms overlap. Couples with primary infertility have never been able to conceive, while, secondary infertility is difficulty conceiving after already having conceived (and either carried the pregnancy to term or had a miscarriage).

**Causes**

Factors that can cause male as well as female infertility are:

- Genetic factors
- Chromosomal defects
- Diabetes mellitus, thyroid disorders, adrenal disease
- Hypothalamic-pituitary factors
- Hyperprolactinemia
- Hypopituitarism
- Environmental factors
- Toxins such as glues, volatile organic solvents or silicones, physical agents, chemical dusts, and pesticides. Tobacco smokers are 60% more likely to be infertile than non-smokers.

For a woman to conceive, certain things have to happen: intercourse must take place around the time when an egg is released from her ovary; the systems that produce eggs and sperm have to be working at optimum levels; and her hormones must be balanced. Some women are infertile because their ovaries do not mature and release eggs. In this case synthetic FSH by injection or Clomid (Clomiphene citrate) via a pill can be given to stimulate follicles to mature in the ovaries. Other factors that can affect a woman’s chances of conceiving include being over- or underweight, or her age as female fertility declines sharply after the age of 35. Sometimes it can be a combination of factors, and sometimes a clear cause is never established.

The main cause of male infertility is low semen quality. Another possible cause is a low sperm count. In some cases, both the man and woman may be infertile or sub-fertile, and the couple’s infertility arises from the combination of these conditions. In other cases, the cause is suspected to be immunological or genetic; it may be that each partner is independently fertile but the couple cannot conceive together without assistance.
Unexplained Infertility

In the U.S., up to 20% of infertile couples have unexplained infertility. In these cases abnormalities are likely to be present but not detected by current methods. Possible problems could be that the egg is not released at the optimum time for fertilization, that it may not enter the fallopian tube, sperm may not be able to reach the egg, fertilization may fail to occur, transport of the zygote may be disturbed, or implantation fails. It is increasingly recognized that egg quality is of critical importance and women of advanced maternal age have eggs of reduced capacity for normal and successful fertilization. Also, polymorphisms in folate pathway genes could be one reason for fertility complications in some women with unexplained infertility.

Treatment

Medical treatment of infertility generally involves the use of fertility medication, medical device, surgery, or a combination of the following. If the sperm are of good quality and the mechanics of the woman’s reproductive structures are good (patent fallopian tubes, no adhesions or scarring), physicians may start by prescribing a course of ovarian stimulating medication. The physician may also suggest intrauterine insemination (IUI), in which the doctor introduces sperm into the uterus during ovulation, via a catheter. In these methods, fertilization occurs inside the body. If conservative medical treatments fail to achieve a full term pregnancy, the physician may suggest the patient undergo in vitro fertilization (IVF). IVF and related techniques are called assisted reproductive technology (ART) techniques.

ART techniques generally start with stimulating the ovaries to increase egg production. After stimulation, the physician surgically extracts one or more eggs from the ovary, and unites them with sperm in a laboratory setting, with the intent of producing one or more embryos. Fertilization takes place outside the body, and the fertilized egg is reinserted into the woman’s reproductive tract, in a procedure called embryo transfer.

Causes of Infertility: Numerous factors may contribute to infertility.

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