CHAPTER 4

REPRODUCTIVE HEALTH

Topics Discussed

Introduction

Need for Reproductive Health

Prevention of Sexually Transmitted Diseases (STD)

Amniocentesis

Birth Control: Needs and Methods

Contraception and Medical Termination of Pregnancy (MTP)

Infertility and Assisted Reproductive Technologies – IVF, GIFT, ZIFT

1. Introduction

Definition of Reproductive Health: According to World Health Organisation (WHO) reproductive health means total well being in all aspects of reproduction – physical, emotional, social and behavioural. In other words reproductively healthy men and women have physically and functionally healthy and normal reproductive organs and normal behavioural and emotional interactions among them in all sex related aspects.

Objectives

At the end of this chapter, you will be able to:

- Understand the general importance of reproductive health.
- Understand the population problems.
- Learn how reproductive awareness can provide a solution to population problems.
- Study the different kinds of birth control and family planning measures.

- Learn about STDs (Sexually Transmitted Diseases) and importance of their awareness.
- Study the modes of transmission, symptoms,treatment options available for different STDs.
- Understand conditions of infertility and different technologies developed to overcome the issues.
- Learn about Assisted Reproductive Technologies (ART).

2. Reproductive Health

2.1 Problems Associated with Reproductive Health

- **Over Population:** India's main problem in every aspect is its population issues which is the excess population which we have.
- **Early Marriages:** In some places marriage age is really low, children are married as soon as they reach puberty. People pay no heed to the government policy norms of strict marriage age.
- **Compromise in health of Mothers and Pregnant women:** Early marriage leads to undeveloped female undergoing pregnancy.
- **Deformities:** Deformities are common in children being born out of early marriage couples.
- **Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR):** These are very high in early marriage.
- **Sexually Transmitted Diseases (STD's):** These is complete lack of awareness about the reproductive organs, contraception, and other devices meant for safe sexual practices and hence this causes high incidences of STD's among people.
- **Sexual Abuse and Sex related crimes:** This is one main issue caused due to lack of awareness of sexual issues and health.
- **Amniocentesis:** Or also known as fetal sex determination is commonly practiced by people even though it is banned by law.

2.2 Strategies Employed for Solving the Problems

- Over population is the main problem of India and it is directly connected with reproductive health. To solve this problem some plans and programs were started, one of this programs was Family Planning Programme. It was initiated in 1951-52.
- There were other programs also, they were generally called Reproductive and Child health care.
- **Awareness about reproduction:** Audio-visual and print media, governmental and non–governmental agencies are doing good job to create awareness among people about reproduction in humans. Parents, close relatives, friends,teachers also have a major role in giving the above information.
- **Sex Education:** Most of the times students reaching puberty try to find out about the reproductive organs through unapproved sources which may misguide them. Hence sex education should be

introduced in schools and encouraged to provide right information through a proper channel and clear the common misconceptions and myths about sex-related aspects.

- **Knowledge of growth of reproductive organs and STD's:** Proper information about reproductive organs, adolescence (period of rapid growth between childhood and adulthood), safe and hygienic sexual practices, sexually transmitted diseases (STD's) such as AIDS, Gonorrhea, Herpes etc. , would help to lead a reproductively healthy life.
- **Birth control devices and care of mother and child:** Fertile couples and people of marriageable age group should know about the different kinds of birth control devices available. There should also be awareness about the care of pregnant mothers (prenatal care), care to be taken during delivery especially in areas where medical facilities etc. are not easily reachable and post-natal care that is after the child is delivered. Special awareness should also be done for stressing on the importance of breast feeding and the importance of female child and equality between male and female child.
- **Prevention of sex abuse and sex related crime:** Awareness of problems like sex abuse and sex related crimes etc. need to be created so that people should think and take up necessary steps to prevent them and thereby build up a reproductively healthy society.
- **Information of reproduction related problems:** For successful action plans to attain, reproductive health requires good infra structural facilities, professional expert knowledge and even material support. These are all necessary to provide medical help and care for reproductive problems like menstrual problems, infertility, pregnancy, delivery, contraception, abortions, sexually transmitted diseases STDs. Implementation of better techniques and new strategies with changing times are necessary to provide better care and help to people for reproductive health.
- **Research in reproductive health area:** Research in this areas should be supported to find out new techniques and methods. Eg: Saheli was a contraceptive drug developed by Central Drug Research Institute (CDRI), Lucknow, India.
- **Medical facilities:** Better awareness about sex related problems, pre-natal care of the mothers, medically assisted deliveries, and post-natal care of mother and infant decrease maternal and infant mortality. Small families, better detection and cure of STDs and increased medical facilities for sex related problems etc. indicate improved reproductive health of male and female adults and children.

2.3 Amniocentesis

Amniocentesis is a fetal sex determination and disorder test based on the chromosomal pattern in the cells in the amniotic fluid surrounding the developing embryo.

Procedure: Amniotic fluid surrounding the embryo contains the cells shed from the skin or other parts of the fetus. The sample of amniotic fluid is removed by the means of a fine needle inserted into the uterus through the abdomen under the guidance of ultrasound system.This fluid is later send to the laboratory for analysis. Different tests can be performed on the sample of amniotic fluid depending on the genetic risk and the indication for the test. Generally this test is used to detect chromosomal anomalies by determining the

number of chromosomes in the cells collected and also certain biochemical and enzymatic abnormalities. Thus if it is established that the child is likely to suffer from a serious and incurable congenital defect, the mother has the choice to get the fetus aborted.

Misuse: In India, however, it is mainly used to detect the sex of the fetus and find out whether the unborn child is a male or female. The female fetus if found out are then aborted. Hence these tests are legally banned for the purpose of determination of sex to avoid female feticide.

TRY IT YOURSELF

1. _____ Programme was initiated in 1951-52.
2. The contraceptive drug developed by CDRI is _____.

2.4 Population Explosion

What is population?

Population is defined as the total number of individuals of a species present in a particular area at a given time. A species has many populations living in different regions.

The scientific study of population is called demography.

Demography deals with three different aspects:

- Changes in population size in terms of growth or decline
- Composition of population
- Distribution of population in space

Demography is composed of five demographic processes namely fertility, mortality, marriage, migration and social mobility. These five processes continually work within a population determining size, composition and distribution.

2.5 Population Growth

Rapid increase in the population over a relatively short period of time is called as population explosion.

The increase or decrease in population size is dependent on four basic processes.

- **Natality –** Refers to the birth rate.
- **Mortality –** Refers to the death rate.
- **Immigration –** The number of individuals that have come into the habitat.
- **Emigration –** The number of individuals of population who left the habitat.

Natality and immigration contribute to an increase in population. Mortality and emigration on the other hand contributes to a decrease in population.

The population density is the number of individuals of a species per unit area / space at a given time.

$$\text{Population Density (D)} = \frac{\text{Number of individuals (N)}}{\text{Space (S)}}$$

Population growth is generally of two types

a. Exponential growth: Shows the **J-shaped growth curve.**

b. Logistic growth: Shows the **S-shaped or Sigmoid growth curve**. This type of population growth is called **Verhulst – Pearl Logistic Growth** as explained by the following equation

$$\mathbf{dN/dT = rN \quad (K - N/K)}$$

Where **N – Population density at a time t**

r – Intrinsic rate of natural increase

K – Carrying capacity.

The distribution of human population is not uniform throughout the world. Some areas are thickly populated and others are thinly populated.

2.5.1 Population Growth Rate

It is indicated by

- The annual average growth rate
- Doubling time

Growth rate depends on birth (fertility) rate, death rate (mortality), migration and age-sex ratio.

- **Fertility (Natality):** Fertility is the ability of the reproductively active individuals to produce babies. Birth rate is the number of babies produced per thousand individuals. It differs from the population growth rate as it is never negative while the growth rate can be negative. Total fertility rate (TFR) is the average number of children that would be born to a woman during her lifetime. The total fertility rate varies from region to region. The more developed countries have lower fertility rates than developed countries. Fertility is mainly controlled by economics and human aspirations.

  Replacement level (RL) is the number of children a couple must produce to replace themselves so as to maintain the population zero growth level. RL is slightly higher than 2.0 because some children die before reaching reproductive age. RL is 2.1 in developed countries and 2.7 in developing countries due to a higher death rate at the immature age.

- **Mortality:** Mortality is the death rate per thousand individuals. Death rate has fallen in most countries. It is due to improved personal hygiene, sanitation and modern medicines.

  Demographers generally use crude birth rate and crude death rate.

Crude birth rate is the number of live births per thousand persons in the middle of a given year. Mostly counted in July 2011 etc.

Crude death rate is the number of deaths per thousand persons in the middle of a given year. Mostly counted in July 2011 etc.

Rate of natural increase: The difference between the number of births and that of deaths is called the rate of natural increase.

Demographic transition: If the birth and death rates were equal, a zero population growth rate would result, which is known as demographic transition. It has occurred in most of the developed countries.

- **Migration:** Migration is the movement of individuals in and out of a place or country. Thus migration is of two types
  - **Immigration:** It is the movement of individuals into an area.
  - **Emigration:** It is the movement of individuals out of an area. Migration may occur within a country as well as between different countries. But population of a country is influenced by net immigration.

  Net immigration: The net immigration is immigration number minus the emigration number. The net immigration may be positive, zero or even negative. Some developed countries allow selective immigration to keep its working force at optimum level.
- **Age and Sex structures:** Bodonheimer (1958) proposed three age groups in a population namely, pre-reproductive, reproductive and post reproductive. Infants and older people have higher mortality rate than individuals of other ages. The proportion of reproductively active males and females in a population also influences the population growth. The birth rate is influenced by the number of female individuals who are in active reproductive age, which are generally 15 - 44 years.

Did You Know

Fecundity is the potential capability of an organism to produce reproductive units such as eggs, sperms or asexual structures.

Reasons for high population growth

The two main reasons for increase in human population are

- Decrease in death rate mainly maternal mortality rate (MMR) and Infant mortality rate (IMR)
- Increase in life span

Other reasons for growth in population are

- **Spread of education –** People of the country are now being educated about health and diseases.
- **Control of diseases –** Due to government efforts many of the epidemics etc. are now successfully controlled and managed, vaccines help survive from an infectious disease, general improvement in the

health care sector gives timely treatment and helps survival rate which in turn reduce mortality rate. Control of communicable diseases has also caused an increasing trend of population.

- **Advancement in agriculture –** Advancement in agricultural sector has solved the main problem of food and hunger. Even better nutrition in turn improves life span.
- **Storage Facility and transport facilities –** Better storage facility can be used to store food grains and transport makes them easier to be distributed in the country preventing famines.
- **Protection from natural calamity –** It decreases death rate.
- **Government Efforts –** Government provides better facilities and infrastructure as well as health and hygiene promotion facilities which improves life span in general and hence there is an increase in population.

2.5.2 Consequences of Over Population

Over population cause a number of problems. The problems caused are not only of individual but of national consequence. Some of them are really grave and hamper social and economic development.

- **Poverty:** If there are more persons in a family and the per capita income is less, then naturally they become poor. With the addition of every new child the family becomes poorer and poorer.
- **Food supply:** If the population increases and the production of food doesn't increase in varying proportions with the population increase then it will lead to food shortage eventually.
- **Over crowding and poor hygienic condition:** More number of people in small area cause overcrowding in that small area leading to lack of infrastructure and formation of slums, also there is more accumulation of waste in the area leading to unhygienic conditions.
- **Unemployment:** More number of people need more number of jobs, which generally doesn't happen and when sufficient jobs are unavailable it leads to unemployment.
- **Housing problems:** More number of people require more housing space and that also leads to lack of homes and overcrowding
- **Pollution:** With rising number or people the amount of waste generated increases and that causes pollution problems.
- **Lack of education:** Since government lacks the infrastructure to provide education for the increasing number of people, many of the underprivileged ones don't get quality education and thus illiteracy becomes rampant.

2.5.3 Measures to Control Population Expansion

- **Education:** People, particularly who are in the reproductive age groups, should be educated about the advantage of the small family. Mass media and educational as well social institutions can play an important role in this campaign. Posters showing happy couple with a slogan "Hum do humare do" should be displayed. Later it was converted to "one child" policy which became more or less a norm.

- **Marriageable age:** Raising the age of marriage is also a very effective means of controlling the population since higher marriage age means more maturity and awareness about different methods of birthcontrol. At present the marriage age is 18 for girls and 21 for boys.
- **Incentives:** Couples having small families should be given more incentives. For couples having only a single girl child should be given social and educational incentives which will promote the message across the masses.
- **Family Planning:** There are many birth control measures available which can check birth rate.

2.6 Census

Census is an official counting of population and preparing data about age groups, births, deaths, sex ratios, education etc. In India, the first census was carried out in 1872. Since 1881 it has been conducted regularly at an interval of 10 years, the last being in 2011. Census is conducted as per the provision made under the Census Act 1948.

Census gives information about the number of individuals present in a given region at a given time.The time required for a population to double itself is called doubling time.

Some Statistics of India's Census 2011:

India's census 2011 was conducted from February 9 to 28 and provisional figures of India's 15th census were released in New Delhi on 31st March 2011.

i. India accounts for 17.5%of the world's population.

ii. India's Population as on March 1, 2011 : 1,210,193,422

iii. Males : 623,724,248

iv. Females : 586,469,174

v. Sex ratio (females per 1000 males) : 940

vi. Population Density (persons per sq km): 382

vii. Decadal (Period of ten years) growth rate of population between 2001-2011:17.64

viii. Most populous state: Uttar Pradesh

ix. Least populous state : Sikkim

x. Among states, Kerala has the highest sex ratio (1084) and among Union territories (UT's), Daman, Diu the lowest (618).

xi. Least populous UT: Lakshadweep

xii. Literacy rate: 74.04% (82.14% for males and 65.46% for females)

xiii. Highest literacy rate: Kerala with 93.91% literacy rate

xiv. Lowest literacy rate: Bihar with 63.82% literacy rate

xv. State with highest density of population – Bihar with 1102 persons per sq.km

xvi. State with lowest density of population – Arunachal Pradesh with 17 persons per sq km.

xvii. Maximum density among union territories – Delhi – National Capital Territory (NCT) with 11297 persons per sq.km.It is also most thickly populated city in India.

xviii. Lowest density among union territories – Andaman and Nicobar with 46 persons per sq.km

xix. Biggest state as per area – Rajasthan

xx. Smallest state as per area – Goa

TRY IT YOURSELF

1. Define the terms: a. Natality and b. Mortality
2. Explain Census.
3. Explain what is population growth and its different types.

3. Birth Control

Birth control refers to restricting the number of children by various methods designed to control fertility and prevent conception.

No single ideal method of birth control exists. The only method of preventing pregnancy which is 100 percent reliable is complete abstinence or complete avoidance of sexual intercourse. Several other methods available including surgical sterilization, hormonal methods, intrauterine devices, spermicides, barrier methods and periodic abstinence.

Most of the birth control methods acts by preventing any one or more of the three major steps in the reproductive processes.

- **Preventing sperm transport to the ovum;**
- **Preventing ovulation and/or**
- **Preventing implantation of early embryo in the uterus.**

Various contraceptive methods are broadly classified as two main types

- Concept of spacing which is commonly used to space births at longer interval times between pregnancies.
- Temporary, terminal or permanent methods.

3.1 Temporary Methods of Birth Control

Temporary methods are commonly used to postpone or to space births.

3.1.1 Natural Methods

These methods avoid the sperm and ovum to meet and interact, ultimately avoiding fertilization of the ovum. These methods can be followed as stated below

- **Periodic abstinence or Rhythm method (Temporary avoidance of sex):**

  A couple can use the knowledge of the physiological changes that occur in the female reproductive cycle to decide whether to abstain from intercourse on those days when pregnancy is likely to result or plan their intercourse on those days if they wish to conceive a child. It's a physiologically based method which was first developed in 1930's and is called as the rhythm method. It involves abstaining from sexual intercourse on those days when ovulation is likely to occur in each reproductive cycle. So three days before the cycle and three days after the cycle the couple abstains from coitus. For instance, if an average woman's cycle is of 28 days , then ovulation occurs at around 14th day of menstruation, ovum remains alive for about 1-2 days and sperms survive for about 3 days. So pregnancy can be avoided if the couple doesn't have intercourse on these days. The effectiveness of the rhythm method for birth control is very poor in many women because of irregularities of menstrual cycle.

- **Sympto – Thermal method (STM):** This is another natural, fertility based method of family planning that is used to avoid or achieve pregnancy. STM utilizes normally fluctuating physiological markers like increased body temperature and increased production of abundant, clear, stretchy cervical mucus that resembles uncooked egg white which indicate ovulation. These indicators provide a kind of double check system by which a female is made aware whether she is fertile or not. Sexual intercourse is abstained during the period to avoid pregnancy. STM users chart these changes and interpret them according to precise rules.

- **Coitus interruptus (Withdrawal method):** Male withdraws his penis from the vagina just before ejaculation to avoid insemination so that semen is carried outside the vagina. This method is moderately effective because controlling ejaculation outside the vagina is difficult since its requires a lot of self-control and before ejaculation the male passes a pre-ejaculation fluid which may contains some sperms at times which may cause the pregnancy even though the male has ejaculated outside the vagina.

- **Lactational Amenorrhea Method (LAM or absence of menstruation):** There is no menstrual cycle and therefore ovulation doesnot occur during intense lactation following parturition. However this method is effective only upto maximum period of six months after child birth.

3.1.2 Barrier Methods

In this method the ovum and the sperm are physically prevented from meeting and interacting due to presence of mainly physical barriers which prevent fertilization. There are different methods available both for males and females and they are as follows

- **Condoms:** A male condom is non-porous latex covering placed over the penis which prevents the deposition of sperm in the female reproductive tract. Nirodh (Hindi name for condom) was the most popular brand of condom for male promoted by government. Condom also provides protection from STD's and AIDS. A female condom is called a vaginal pouch or femidom is designed to prevent the sperm from reaching the uterus. It is composed of two flexible rings connected by polyurethane sheath, one ring inside the sheath and is inserted to fit over the cervix and the other ring remains outside the vagina and protects the external genitalia. A diaphragm is a rubber, dome shaped structure that fits over the cervix and is used in conjunction with a spermicide. It can be inserted by the female upto 6 hrs before intercourse. The diaphragm prevents the entry of the sperm through cervix whereas the spermicide kills all other sperm which get around it. Even though the diaphragm provides some protection against a few STD's, it does not provide any protection against HIV because the vagina is still exposed. A cervical cap is same as the diaphragm but is smaller in size and more rigid. It fits snugly over the cervix. It should be fitted by a health care professional. Both diaphragm and cervical cap should be used with spermicidal jellies. There are others such as the vault cap which is a thick hemisphere. These are modifications of the standard diaphragm and have different shapes, sizes, functions and abilities. This is meant to fit on the vaginal vault over the cervix.

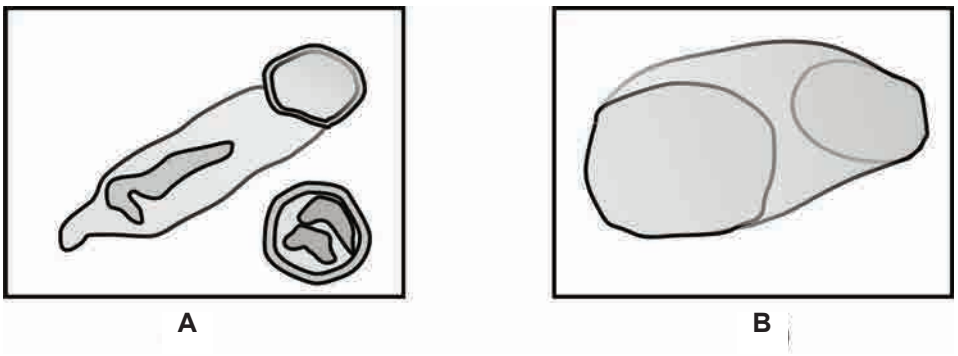

Figure 4.1: Diagrammatic representation of **A.** Male condom and **B.** Female condom

- **Spermicides:** Different kinds of foams, creams, jellies, suppositories, douches etc. that contain sperm killing agents or spermicides make the vagina and cervix unfavourable for sperm survival. These are available without prescription. The common spermicides used in these are the lactic acid, citric acid, boric acid, zinc sulphate and potassium permanganate. Sponge (Today) is a foam suppository or tablets containing nonoxynol as spermicide. Delfin is also available in the form of cream. They can be used by anyone who is not allergic to these spermicides. These are relatively unreliable though and should be used with a barrier method like a condom, cervical cap, femidom or vault cap.
- **Intrauterine devices (IUD's):** An intrauterine device is a small object made up of plastic, copper, stainless steel that is inserted by a health care professional into the cavity of the uterus. These devices are presently very popular. These are presently available as non-medicated IUD's such as Lippe's loop, copper releasing IUD's Eg: Cu T, Cu 7, Multiload 375 and some of the hormone releasing IUD's Eg: Progestasert, LNG-20. IUD's increase phagocytosis of sperms within the uterus and the Cu ions

which are released, suppress sperm motility as well as the fertilizing capacity of sperms. The hormone releasing IUD's make the uterus unsuitable for implantation and the cervix hostile to the sperms. IUD's are ideal methods of methods used by females.

Drawbacks of IUCD's or IUD's (Intrauterine devices) include

- Their spontaneous expulsion, sometimes without the woman's knowledge.
- They cause excessive menstrual bleeding and pain.
- Their presence may act a minor irritant and makes the egg move down the oviducts and the uterus before fertilization or implantation.
- Risk of perforation of the uterus.
- Tubal pregnancy in plantation of the embryo in the oviduct (Fallopian tube).
- Risk of infection.

This method is not for those who eventually intend to conceive.

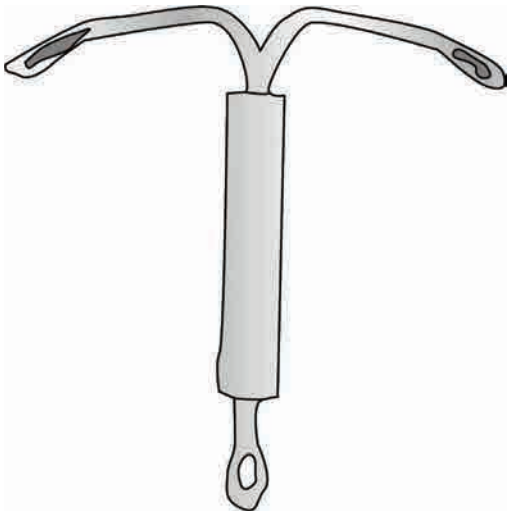

Figure 4.2: Diagrammatic representation of intrauterine device (IUD) for birth control

3.1.3 Hormonal Methods

Aside from complete abstinence or surgical sterilization, hormonal methods are the most effective means of birth control. Oral contraceptives in the form of pill contain the hormones designed to prevent pregnancy.

Two types of the pills include combined oral contraceptives and progestin only pill.

- **Combined oral contraceptives –** They are the most widely used oral contraceptive pill. They contain a dose of synthetic progesterone and estrogen to check ovulation. The primary action of COC's is to inhibit ovulation by suppressing the gonadotropins, Follicle stimulating hormone (FSH) and Luteinizing

hormone (LH). The low levels of FSH and LH prevent the development of dominant follicle in the ovary, as a result ovulation does not occur, even if it does in some cases there is no surge of LH midcycle and hence it prevents pregnancy.

- **Progestin only pill –** Proegstins thicken the cervical mucus and make it more difficult for the sperm to enter the uterus. Progestin pills thus thicken the cervical mucus and may block implantation in the uterus and inhibit the transport of ova as well as sperm in the uterine tubes. They do not inhibit ovulation.

  There are several, different kindsof pills with varying usage

  - **Combined pill –** Contains both progestin and estrogens and is taken once a day for 3 weeks to prevent pregnancy and regulate menstrual cycle. The pills taken during the fourth week are inactive (do not contain hormones) and allow menstruation to occur.
  - **Extended cycle birth control pill –** Contains both progestin and estrogens and is taken once a day in 3 months cycles of 12 weeks of hormone containing pills followed by 1 week of inactive pills. Menstruation occurs during the thirteenth week.
  - **Minipill –** Contains progestin only and is taken every day of the month.
  - **Emergency contraceptive pill (ECP or morning after pill) –** Consists of estrogens and progestins or progestins alone to prevent pregnancy following unprotected sexual intercourse. The high levels of progestin and estrogen in the EC pills provide inhibition of FSH and LH secretion. Loss of stimulating effects of these gonadotropic hormones cause the ovaries to cease secretions of their own estrogens and progesterone. In turn declining levels estrogen and progesterone induce shedding uterine lining, thereby blocking implantation. One pill is taken as soon as possible but within 72 hours of unprotected sexual intercourse. The second pill must be taken 12 hours after the first. The pills work in the same way as regular birth pills but as the name suggest these pills are only to be taken in case of instances when the condom breaks or in the case of rape etc. The brands available are i-pill, PILL 72 and UNWANTED 72.They are effective in the first 24 hours. Their side effects include menstrual irregularities breakthrough bleeding from the uterus, vomiting etc. They have a high dose of the hormones and hence should not be used in place of regular contraception.

  Other methods for non–oral methods of hormonal contraception include

  - **Contraceptive skin patch (Ortho Evra):** Contains both progestins and estrogens delivered in a skin patch placed on the skin (upper outer arm, back, lower abdomen, or buttocks) once a week for 3 weeks. After 3 weeks the patch is removed and new one is placed elsewhere. During the fourth week no patch is used.
  - **Vaginal Contraceptive ring (Nuva Ring):** A flexible doughnut shaped ring of about 5 cm (2 inches) in diameter that contains estrogens and progesterone is inserted by the user into the vagina. It is left into the vagina for 3 weeks to prevent conception and then removed for 1 week to permit menstruation.

- **Subcutaneous implants (Norplant):** A new method of contraception is subcutaneous (under the skin) implantation of synthetic progesterone. It acts similarly to oral contraceptives by blocking ovulation and thickening the cervical mucus to prevent sperm transport. These implants are effective for upto five years. Six matchstick sized capsules containing the steroid are inserted under the skin of the inner arm above the elbow. The capsules slowly release the synthetic progesterone for about 5 years. It is very convenient and effective plus long lasting for upto five years. The woman has irregular periods or periods maybe absent. Minor surgical procedure is needed for insertion and removal.

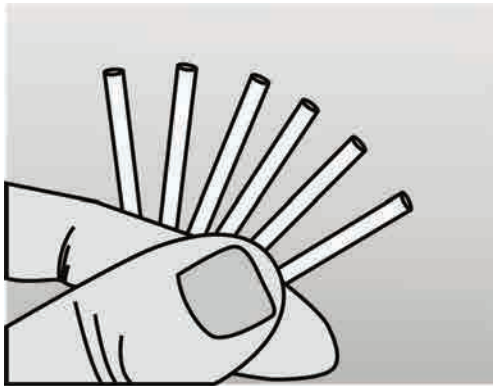

Figure 4.3: Diagrammatic representation of subcutaneous implants

- **Hormone Injections (Depo–Provera):** These are progestin injections given intramuscularly by a health care practioner every three months. It releases very slowly and prevents ovulation. They are convenient and highly effective with no serious effects with no serious side effects. There may be occasional heavy menstrual bleeding.

Knowledge Builder

Table 4.1: Temporary methods of contraception

Natural	Barrier	Hormonal	
Periodic abstinence/ Rhythm method	Condoms – Male and Female	**Oral**	**Non-oral**
Sympto-Thermal (STM method)	Spermicides – Creams, jellies, foams, suppositories, gels etc.	COC – Combined oral contraceptive pills Types : Combined pills, extended cycle birth control pill, mini pill	Contraceptive skin patch (Ortho-evra) Vaginal Contraceptive ring (Nuva ring) Subcutaneous implants (Norplant)
Coitus interruptus/ Withdrawal method	IUD's or IUCD's Intrauterine contraceptive devices like Copper T , Lippe's loop etc.	Emergency contraceptive pills. (I-pill, Unwanted 72,Pill 72)	Hormone injections (Depo Provera)
Lactational Amenorrhoea (LAM)			

TRY IT YOURSELF

1. What are the different kinds of temporary methods of contraception?
2. Write a note on the hormonal method of contraception?
3. What are the different barrier methods of contraception and how do they work?

3.2 Permanent Methods of Birth Control

These methods prevent pregnancy by blocking gamete transport and hence prevent fertilization. These are mostly done with the help of a major or minor surgery and in many cases are not easily reversible. Permanent methods of birth control are preferred by those couples who already have children and do not wish to have more but at the same time want to enjoy sexual intercourse without the hassles of using temporary birth control measures.

3.2.1 Surgical Sterilization

Sterilization is a procedure which renders the individual incapable for further reproduction. Sterilization procedure in males is called vasectomy. In this a small portion of the each ductus deferens or vas deferens is removed. In order to gain access to the ductus deferens, an incision is made with a scalpel (scalpel/ conventional procedure of vasectomy) or puncture is made through a special forceps (non scalpel vasectomy). After this the ducts are located and cut and tied (ligated) in two places with stitches and the portion between the two ties in removed. Although sperms be produced in the testes, they cannot reach the exterior of the body. The sperm produced then degenerate or are removed by phagocytosis. Because the blood vessels are not cut, the testosterone levels in the blood remain normal, so vasectomy has no effect on sexual desire and performance. If the procedure is done correctly, it is 100 percent effective. The procedure can be reversed if needed but the chances of regaining fertility is only 30-40 percent. Sterilization in females is mostly done by a procedure called as tubal ligation. In tubal ligation a small portion of the fallopian tube is tied closed and cut. This can be achieved in different ways. “Clips” or “clamps” can be placed on the uterine tubes, the tubes then tied and or cut and sometimes the tubes are cauterized. In any case the secondary oocyte cannot pass through the uterine tubes and hence the sperm cannot reach the oocyte and hence fertilization does not occur.

Please note that the selection of a suitable contraceptive method should be practiced in consultation with the qualified doctors. It must also be remembered that contraceptives are not needed as regular requirements for keeping good reproductive health because they are against the natural conception/pregnancy. Even though they are useful to keep population in check they have their own set of ill effects ranging from mild nausea, abdominal pain, bleeding, menstrual cycle changes and problems, irregular bleeding or heavy bleeding from the uterus and even an increased risk of breast cancer.

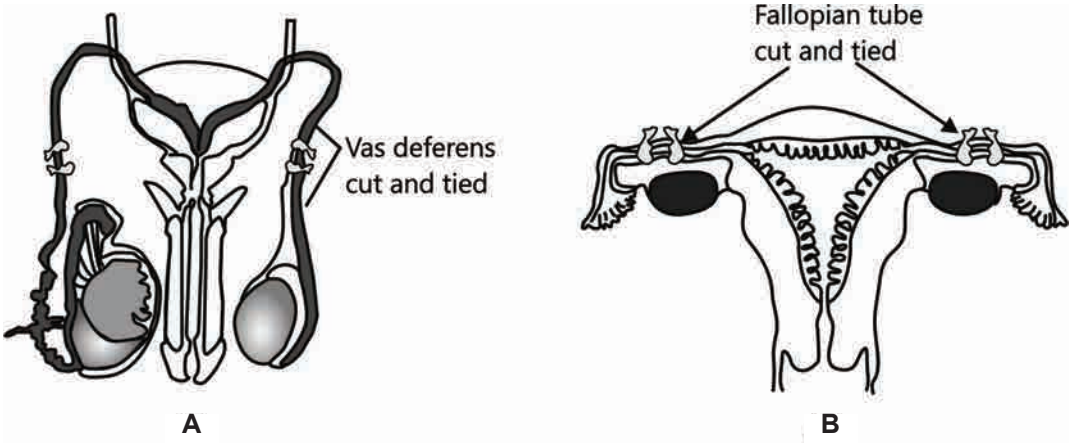

Figure 4.4: Diagrammatic representation of **A.** vasectomy (male sterilization) and **B.** tubectomy (female sterilization)

3.3 Medical Termination of Pregnancy (MTP)

Also known as abortions in common terms , there is a difference between spontaneously occurring abortions caused by reasons unknown which are also known as miscarriages and those which are caused out by human interventions in pregnancies are mostly called as MTP or medically terminated pregnancies.

The definition of MTP or medical termination of pregnancy or abortion is the termination of pregnancy before the fetus viable. Government of India legalized abortion or MTP in 1971.

Period: MTP is generally considered safe upto 12 weeks (the first trimester) of pregnancy. It becomes more risky after the first trimester period of pregnancy as the fetus becomes intimately associated with the maternal tissues.

Status or Incidences: Around 45 to 50 million MTP's are done in a year all over the world which is about 1/5th of the total number pregnancies occurring in a year.

Types of MTP

- **Spontaneous MTP:** One third of the total pregnancies abort spontaneously within four weeks of conception. In most of the cases the woman does not realize that she has been pregnant and the abortion passes unrecognized as menses.
- **Therapeutic MTP:** A pregnancy can be legally terminated in its early stage if the doctor advises that its continuation would seriously affect the health of the mother. At present, the law allows termination uptill the 28^{th} week of pregnancy if the family physician and the gynecologist consider there is a need for abortion.

What is the need of MTP or what are the general reasons women undergo MTP?

The answer to this question is based made up of different physical, psychological, medical, and psychosocial aspects.

- **Physical:** In case a woman does not use contraceptives during sexual intercourse and accidentally got pregnant without having any intention to do so or failure of used contraceptive.
- **Psychological:** A woman is mentally unprepared for the pregnancy.
- **Medical :** The pregnancy is harmful or in some cases to the mother of the child. The mother is not physically and mentally fit enough for child birth and an impending pregnancy can kill either of the two or both. Second case is when the fetus is detected with severe congenital defects and chromosomal abnormalities, in such cases the mother has the right to decide upon a MTP and it is mostly prescribed by the consulting physician.
- **Psychosocial:** Sometimes the pregnancy arises from a sexual assault or rape, the woman can decide to abort the pregnancy if she did not intend to have it and if it could have some psychological as well as social repercussions on her.

Significance

- MTP helps in getting rid of unwanted pregnancies and such pregnancies which may be harmful or even fatal either to the mother or to the fetus of both.
- MTP plays a significant role in decreasing human population.

Drawbacks/Misuse

- MTP is being misused to abort even the normal female fetuses.
- Majority of MTPs are performed illegally by unqualified persons and has resulted in several fatalities.
- MTPs generally raise many emotional, ethical, religious as well as social issues.

Did You Know

- Govt. of India enforced the Pre-natal diagnostic techniques (Regulation and Prevention of Misuse) Act , 1994 ,since January 1, 1994 under which all the genetic counseling centres and laboratories are required to apply for registration.
- Destruction of fetus in the uterus is called as foeticide.

4. Sexually Transmitted Diseases (STDs)

Definition: Diseases or infections which are transmitted through sexual intercourse with infected persons are collectively called as Sexually transmitted diseases or STD's or Veneral diseases or Reproductive tract infections (RTI's).

Causative Agents: STD's are usually caused by the following agents

- Bacteria
- Viruses
- Chlamydia
- Protozoa
- Nematodes
- Ectoparasites
- Fungi

Modes of transmission : STD's are transmitted by various modes

- Sexual intercourse with infected persons.
- Sharing of infected needles and surgical instruments.
- Transfusion of blood from an infected mother to the fetus.

However in this chapter only the mode of transmission through sexual contact and those which are transmitted through using common, shared utilitarian items like items used for maintaing personal hygiene items and sharing of common toilets etc. will be considered and explained.

Cure: All STD's are completely curable if detected early and treated properly with the exception of HIV infections, Hepatitis B and genital herpes or warts.

Consequences of delayed treatment: STD's may lead to many complications if proper and timely treatment is not given. The main complications include pelvic inflammatory disease (PID), abortions, still birth, ectopic pregnancies, infertility and cancer of the reproductive tract.

Awareness and government efforts: Since STDs are a major threat to the society since most of the patients hesitate to undergo treatment since they fear that they will judged for their moral behavior. According to the statistics incidence of STD's is very high in the age groups of 15-24 years of age. Government of India has initiated special reproductive health care programs to prevent the early occurrence, early detection and cure of these diseases.

Prevention: Prevention is comparatively simple than cure. Simple principles should be followed such as

- Avoid sex with unknown partners or multiple partners
- One should always use condoms during intercourse
- If a person is in doubt he/she must consult a qualified doctor
- If STD's are detected one should complete the full course of treatment till treated and healthy again.

Confirmatory tests for detection and conformation of STD's

- Culture and microscopic observation with specific staining of causative agent.
- Detection of specific antigen/antibody using Enzyme Linked Immunosorbent Assay (ELISA) like technique.
- DNA hybridization.
- Polymerase chain reaction.

4.1 STDs Caused by Bacteria

4.1.1 Syphilis

Causative agent/pathogen –*Treponema pallidum*

Symptoms: This disease occurs in different stages: In the first stage there is hard infectious and painless ulcer on the genitals accompanied by swelling of local lymph glands. This sore is also known as chancre. Chancre is the initial lesion of syphilis which is more or less like a distinct hard base ulcer or a sore. In the second stage, chancre is healed and there are skin lesions, rashes, hair loss, swollen joints and flu like illness occasionally. In the third or the tertiary stage chronic ulcers appear on the palate, nose and lower leg. There can be paralysis, brain damage, blindness, heart and aortic impairment. In latent syphilis there is no evidence of the disease.

Diagnosis: It is diagnosed by clinical symptoms, microscopic examination and antibody detection, ELISA test.

Incubation period: 10-90 days

Treatment: Antibiotics such as Penicillin, Tetracycline

4.1.2 Gonorrhoea

Causative agent/pathogen – *Neisseria gonorrhoeae*

Symptoms: The infection mainly occurs in the genital tubes and produces a pus like discharge, along with pain around the genitalia and burning sensation during urination. It may lead to arthritis and eye infection in children of mothers afflicted by gonorrhea.

Diagnosis: Mostly diagnosed by clinical symptoms, gram staining of discharge and culture.

Incubation period: 2-5 days

Treatment: Antibiotics like Penicillin and ampicillin

4.1.3 Chancroid

Causative agent/pathogen – *Haemophilus ducreyi*

Symptoms: There is an appearance of an ulcer at the site of infection mostly on the external genitalia. It is painful and bleeds easily. The nearby lymph nodes swell up and become tender.

Diagnosis: Mostly clinical symptoms, staining of discharge from the sore and cell culture.

Treatment: Antibiotics like ceftriaxone,erythromycin,ciprofloxacin and trimethoprim-sulphamethoxazole.

4.2 STDs Caused By Viruses

4.2.1 Acquired Immuno Deficiency Symptoms (Aids)

Causative agent/pathogen – Human Immunodeficiency Virus (HIV)

Symptoms: Many symptoms but the most common ones include fever, lethargy, pharyngitis,

Weight loss, nausea, headaches, rashes etc. HIV attacks the T-helper cells and hence the person's immunity is unable to protect the body against any infections. The person succumbs to any disease or secondary infections which normally would not have proved so fatal and death is not due to AIDS.

Diagnosis: ELISA test and Western Blotting tests are commonly used. Western blotting is mostly used to confirm the results obtained in ELISA. PCR can also be used for diagnosis.

Treatment: Although there is no known cure for AIDS, there are certain drugs which can prolong the life of the infected person. This therapy is known as ART or antiretroviral therapy. Zidovudine or Azidothymidine (AZT) is the drug of choice for the treatment of AIDS. Didanosine is another drug employed to treat AIDS.

4.2.2 Hepatitis B

Causative agent/pathogen Hepatitis B Virus HBV

Symptoms: Symptoms mostly include fatigue, jaundice (yellowing of skin), persistent low grade fever, rash and abdominal pain. It can cause cirrhosis and in liver cancer the later stages.

Diagnosis: Australian antigen test which is now also called the Hepatitis B surface antigen test (HBSAg). ELISA can also be used.

Incubation period: 30-80 days

Treatment : Not curable. However, prevention vaccines are widely available .

Hepatitis C is a secondary infection which occurs in Hepatitis B patients is also detected by ELISA.

4.2.3 Genital Herpes

Causative agent/pathogen–*Herpes Simplex virus*

Symptoms: There are many lesions which resemble vesicles or pustules , which are later followed by clusters of painful erythematous ulcers over genitalia and peri-anal regions. Symptoms are more severe in females. Infections of neonates can occur in case of infected females. Accompanied by this there is fever, headache, pain, itching, vaginal and urethral discharge along with swelling of lymph nodes. Infections of the urethra and cervix may also occur.

Diagnosis: Mostly by clinical symptoms, antigen detection, PCR and nucleic acid hybridization.

Treatment: Incurable. Once the virus enters the body, it remains there forever.

4.2.4 Genital Warts

Causative agent/pathogen– Human Papilloma Virus (HPV)

Symptoms: Warts which resemble small benign tumors with hard outgrowth and horny surface develop all over skin and mucosal surface of the external genitalia and perianal area. In women the infection may enter vagina and cervix. May result in cervical and vaginal cancer if left untreated.

Diagnosis: Mostly by clinical symptoms, antibody detection, culturing and DNA hybridisation.

Treatment: Removal of warts requires special surgical skills especially for removal of internal warts. Cryosurgery is used to remove the warts. *Podophyllum* preparations are used for removal of the warts. The preparation is made from the dried rhizome and roots of *Podophyllum peltatum*.

4.3 STDs Caused by Chlamydia

Causative agent/pathogen – *Chlamydia trachomatis*

Symptoms: *Chlamydia trachomatis* is a human pathogen that causes trachoma, sexually transmitted and perinatal infection. It is an obligate intracellular pathogen. It causes urethritis epididymitis (inflammation of the urethra and the epididymis) with unilateral scrotal pain, tenderness and swelling, mucopurulent with yellowish mucus and pus, cervicitis inflammation of the cervix, inflammation of the fallopian tubes, proctitis (rectal pain with mucus and occasional bleeding).

Diagnosis: Clinical symptoms, Gram-staining of discharge, antigen detection and nucleic acid hybridization.

Incubation period: About one week.

Treatment: Antibiotics like tetracycline, erythromycin and rifampicin are effective but penicillin is not much effective in treating chlamydiasis.

4.4 STDs Caused by Protozoans

4.4.1 Trichomoniasis

Causative agent/pathogen – *Trichomonas vaginalis*

Symptoms: The symptoms differ in males and females. In females it causes vaginitis which is characterized by foul smelling, yellow vaginal discharge and burning sensation. In males it causes urethritis, epididymitis and prostatitis resulting in pain and burning sensation.

Diagnosis: By clinical symptoms, microscopic examination, culture and immunofluorescent antibody staining.

Treatment: Metronidazole to be given to both partners simultaneously.

4.4.2 Amoebiasis

Causative agent/pathogen – *Entamoeba histolytica*

Symptoms: Presence of blood in stools and feces. Transmission of this disease is mostly through oral route but sometimes it maybe through sexual contact also.

Diagnosis: Clinical symptoms, stool tests.

Treatment: Antiamoebic tablets are given to the patient.

4.4.3 Giardiasis

Causative agent/pathogen – *Giardia lamblia*

Symptoms: It lives in the human intestine. Interferes with digestion and absorption of food.

Epigastric pain, abdominal discomfort, diarrhoea, headache and sometimes fever.

Diagnosis: Normally the disease is caused through contaminated food and sometimes through sexual contact. Clinical symptoms and stool tests.

Treatment: Antiamoebic tablets are given to the patient.

4.5 STDs Caused by Nematode

4.5.1 Enterobiasis

Causative agent/pathogen – *Enterobius vermicularis* (commonly known as pinworm)

Symptoms: Intense itching at the anus, and the external genitalia, inflammation of the membrane of colon and appendix, nausea, abdominal pain and diarrhoea.

Diagnosis: Generally the infection is through the faeco-oral route, where the patients scratches the area and the eggs are under the person's nails which may infect others. Transmission sometimes also occurs during sexual contact.

Treatment: Antihelminthic tablets are recommended.

4.6 STDs Caused by Arthropods (Ectoparasites)

4.6.1 Scabies

Causative agent/pathogen – *Sarcoptes scabiei*

Symptoms: Intense itching and crusty patches on the skin which increases and spreads as the mites burrow deeper into the skin.

Treatment: Scabicides are used for treatment. They are available in the form of creams and lotions.

4.6.2 Pediculosis

Causative agent/pathogen – *Phthirus pubis* (commonly known as Pubic lice)

Symptoms: Painful itching and red patches in the skin of the pubic region are found. The lice lays eggs near the base of the pubic hair and young hatch within a few days to expand the infestation. The infection spreads by sexual contact or by sharing bedsheets, clothes, towels etc.

Treatment: Medicated shampoos are recommended.

4.7 STDs Caused by Yeast (Fungus)

4.7.1 Candidiasis

Causative agent/pathogen – *Candida albicans* (commonly known as vaginal yeast)

Symptoms: Infection sites include most commonly the mouth, colon and vagina. Women with yeast infections experience painful inflammation of the vagina often with a thick, cheesy discharge. Man may develop a painful inflammation of the urethra through sexual contact with an infected woman.

Treatment: Antibiotics such as clotrimazole, miconazole and nystatin.

KNOWLEDGE BUILDER

STD's						
Bacteria	**Viurses**	**Chlamydia**	**Protozoa**	**Nematode**	**Arthropods**	**Yeasts**
Syphilis *(Treponema pallxidum)*	AIDS (HIV)	Chlamydiasis *(Chlamydia trachomatis)*	Trichomoniasis *(Trichomonas vaginalis)*	Enterobiasis *(Enterobius vermicularis)*	Scabies *(Sarcoptes scabiei)*	Candidiasis *(Candida albicans)*
Gonorrhoea *(Neisseria gonorrhoeae)*	Hepatitis B (HBV)		Amoebiasis *(Entamoeba histolytica)*		Pediculosis *(Phthirus pubis)*	
Chancroid *(Hameophilus ducreyi)*	Genital Herpes (Herpes simplex virus)		Giardiasis *(Giardia lamblia)*			
	Genital Warts (HPV)					

5. Infertility

Definition: Infertility is said to be the failure to conceive within one or more years of regular unprotected coitus (copulation). Infertility can occur both in males as well as females.

Did You Know

- **Implications of infertility:** Since the beginning of the time infertility has been a source of personal misery and even of national crises. It was once and still in some communities regarded as disgrace, as a mark of divine displeasure, as grounds for divorce and compulsory suicide (on the part of woman only). The Egyptians, Greeks and earlier civilizations all had their treatments like love potions, amulets, prayers, sacrifices and the like. Most of the times the female partner was blamed for the infertility. Atleast, the Greeks were aware of the male infertility.
- Sterility is the absolute state of inability to conceive.

There exist two main types of infertility

- **Primary infertility:** Primary infertility is present in those patients who have never conceived.
- **Secondary infertility:** These patients have previously conceived but fail to conceive subsequently.

What is described as fertility?

The semen of a fertile male is 2.5 – 5 mL per ejaculation with a sperm count of about 200 – 300 million mostly motile, having a high fructose content and fluidity which is deposited high in vagina.

Any defect in the sperm count, sperm structure and sperm motility in the seminal fluid leads to infertility. Low sperm count is called as oligospermia, while the near absence of sperms is called as azoospermia. Low sperm motility is asthenospermia while defective sperm morphology is called as teratospermia.

5.1 Infertility in Males

Different health and other conditions may cause infertility in males. The reasons could be

- **Cryptorchidism:** This is the natural condition in which the testes are unable to descend in scrotal sacs so that sperms are not produced azospermia.
- Thyroid dysfunction
- Gonadotrophin deficiency (LH, FSH deficiency)
- Presence of anti-sperm antibodies like IgG, IgM and IgA. IgG maybe found in cervical mucous serum and semen.
- Absence or blockage of vasa deferentia and vasa efferentia.

- Y-chromosome deletions.
- **Immotile cilia –** Sperms are unable to move from vagina to the upper portion of the genital tract of the female.
- **Varicocoela –** The scrotal temperature fluctuates due to collection of dilated veins causing oligospermia.
- **Impotency –** The male is unable to erect and penetrate the penis into the vagina of the female.
- Coital problems in which there is failure to deposit sperm high in vagina.
- ADAM Androgen deficiency in ageing males, also called as male menopause.
- Low fructose content and more prostaglandin content in the seminal fluid.

Other reasons include

- **Alcoholism, since it causes defective spermatogenesis.**
- **Use of hypertensive and antipsychotic drugs for a long time.**
- **Vasectomy.**

5.2 Infertility in Females

Reasons of infertility in females are mostly of the natural origin and not generally due to health conditions.

- **Anovulation:** It means no ovulation at all. There are also conditions like oligo-ovulation or deficient ovulation. There is no corpus luteum formation.
- Luteal phase defect (LPD), drug induced ovulation, decreased level of FSH and LH.
- **Defective growth of the uterus and the vagina:** There maybe some congenital defects in the uterus and vagina.
- Unfavourable endometrial or uterine factors like chronic endometritis, or fibroids in the uterus also prevent pregnancy.
- Unfavourable cervical factors include ineffective sperm penetration, chronic cervicitis, presence of anti-sperm antibody in the vagina, or elongation of the cervix.
- Fimbriae of the fallopian tube may not pick up the secondary oocyte from the ovary.
- Dyspareunia (painful sexual intercourse).
- Increased sperm phagocytosis by the macrophages.
- Fertilization and implantation failure.
- Early miscarriage.
- Ectopic pregnancy.
- Tubectomy.
- Lack of knowledge of the timing of coitus to utilize the fertile period by both the male and female is also important cause of infertility.

5.3 Treatment of Infertility

For couples who do not have children, some treatment at the clinic level have been known to solve the problem of infertility. In males, use of Vitamin E, C, folic acid and Vitamin B12 have known to be helpful in case of oligospermia to improve the sperm count.

Intake of Clomiphene citrate (25-50 mg daily for 25 days a month for three months) improves the secretions of gonadotropins and stimulates the secretion of testosterone.

Testosterone may also be taken orally (100-160 mg daily for 3-4 months).

Dexamethasone is used to correct the presence of antisperm antibodies in the semen.

Incase of obstruction of vasa efferentia and vasa deferentia as well as varicocoele and non-descent of testes, a type of surgery is used to bring these systems to normal or corrective measures.

Sometimes very simple techniques like avoidance of alcohol and wearing light and cool undergarments instead of warm ones can solve the problem of fertility in men.

In females too dexamethasone is used to correct anti-sperm antibodies in cervical mucus.

Clomiphene citrate is used to induce ovulation and ovarian cysts, uterine defects and fallopian tube blockages can be corrected by surgery.

Did You Know

Vitamin E maintains normal functioning of the reproductive organs hence vitamin E is also called as antisterility vitamin.

6. Assisted Reproductive Technologies (ART)

However when all the above said techniques also fail then the couples can be assisted by ART or Assisted Reproductive Technologies.

Different techniques have been developed over a period of time to assist those couples who fertility problems cannot be solved over the clinic level. These range from the much simpler artificial insemination to test tube baby.

Some of these ART techniques will be discussed in this section.

6.1 IVF (In Vitro Fertilization)/ET (Embryo Transfer)/Test Tube Baby

As this was successful in the veterinary world it was also developed as an alternative treatment for women whose fallopian tubes were severely damaged or occluded. Now it is used for many other conditions like long standing unexplained infertility, treated endomteriosis, male factor infertility, cervical hostility, and sometimes or rarely after therapy to female cancers. Though the numbers of IVF centres across the world

keep on increasing, it still remains a very limited service since it is expensive, very specialized technique and requires good laboratory facilities with a good team of skilled workers.

Technique: Superovulation is stimulated by use of clomiphene and or gonadotropins so that several ova can be harvested at once. The oocytes retrieval can be laparscopically and percutaneously. Now a days it is done transvaginally under ultrasound guidance of the transvaginal transducer. A single puncture is made in the vagina and the ovary and several oocytes are aspirated one after another. The oocytes are then inseminated in vitro by fresh or cryopreserved semen. After 16-18 hrs they are examined for presence of two pronuclei which confirms fertilization. The zygote is returned to the incubator to allow cleavage till the 2-4 cell stage when they are ready to transfer to the uterus. In another terms this is called the test-tube baby however the test tube is rarely used as the procedure is generally done in the petridish.

Since the ova from the wife /donor female and sperms from the husband/donor male are induced to form the zygote or eight-celled blastometere outside the body under sterile laboratory conditions, it is also known as ZIFT or Zygote Intrafallopian transfer when it is transferred to the fallopian tube of the female.

However if the embryo is more than eight-celled blastomeres then it is directly transferred to the uterus which is termed as IUT (Intra uterine transfer) to complete its further development. Thus, this is IVF since the fertilization occurs outside the body in the lab petridish, followed by embryo transfer (ET). Embryo formed by in vivo fertilization (fusion of gametes within the female) can also be used for such transfer. The implantation of the embryo takes place in the uterus where it develops into a fetus which forms a child. After the completion of gestation period the mother gives birth to a normal child. The term test tube baby doesn't mean the child was reared in the test tube.

Success rate: The success rate of this technique is less than 20 percent.

Did You Know

1. The first test tube baby born was Louise Joy Brown, born to the parents Lesley and Gilbert Brown on July 25, 1978 , in Oldham, Lancashire, England with the help of Dr. Patrick Steptoe and Dr. Robert Edwards. Dr. Edwards got a Nobel Prize in 2010 for developing a technique for production of test tube baby. Later on test tube babies were born at other hospitals too in different countries.
2. On 6th August, 1986 at K.E.M Hospital, Mumbai ,India's first test tube baby was born. Her name was Kum. Harsha. The credit for India's first test tube baby goes to Dr. Indra Hinduja. Some persons also claim that Asia's first and world's second test tube baby was born in Kolkata on 3 October 1978. The child's name was Durga previously now changed to Kanupriya. However the efforts of the doctor were not recognized timely and caused his death, creating a great controversy around this.

   In 2003 however ICMR recognized his efforts posthumously giving him the credit for being the pioneer of IVF in India. The doctor's name is Dr. Subas Mukherjee.

6.2 Artificial Insemination Technique (AIT)

Artificial insemination is used in cases where there is inability of the male partner to ejaculate or has very low sperm count. In this cases the sperm collected from the male or any other donor are artificially introduced into the vagina or uterus of the female. If the sperm are introduced into the uterus then it is known as IUI – Intra uterine insemination of the female. First the ovulation period of the female in concern is noted and recorded for a period of time to confirm and then just near the ovulation, about 0.3 ml of washed and concentrated semen having atleast 1 million sperms from husband is introduced artificially through a flexible polyethylene catheter into the vagina or into the uterus. Washing in culture media removes the proteins and prostaglandins from the semen. Best results are obtained when the motile sperm count is more than 10 millions. The fertilization capacity of the spermatozoa (sperms) is 24-48 hours. The same procedure maybe repeated 2-3 times over a period of 2-3 days. **Success:** The result varies, ranging from 20-40 per cent. IUI along with superovulation gives a better success rate than plain artificial insemination. In case, the husbands sperms are defective, then the semen is taken from semen bank.

6.3 Gamete Intrafallopian Transfer (GIFT)

This method was first discovered by Asch and colleagues in 1984. It was more expensive and invasive procedure than IVF but had better results than it. In this technique both the sperm and unfertilized oocytes are transferred into the fallopian tubes. Fertilization then takes place in vitro in the female body as it does generally in natural fertilization. But for GIFT normal fallopian tubes is a must criteria. The indications are the same as in those for IVF except the tubal factor. Best results are obtained in unexplained fertility but results may be poor in case of male factor abnormality. The female is superovulated as in the case of IVF and then oocytes are collected. Two collected oocytes along with about 200,000-500,000 motile sperms for each fallopian tubes are transferred through laparoscope and inserted 4 cm into the distal end of the fallopian tube where the combination is injected.

Success: Rate of success is 27-30 percent.

6.4 Intra Cytoplasmic Sperm Injection (ICSI)

It was first developed by Steirteghem and colleagues in 1992 in Belgium. The common indications for this procedure were the following conditions: Severe oligospermia, obstruction of the efferent duct system in male, presence of sperm antibodies, congenital absence of both vasa efferentia and vasa deferentia in male, failure of fertilization in IVF, hardened zona pellucida, unexplained infertility etc.

In this procedure first sperms are collected through ejaculation. Sperms can be recovered by TESE (Testicular sperm extraction) or by MESA (Microsurgical epididymis sperm aspiration) techniques.

In this technique, one single spermatozoan or sperm is injected directly into the cytoplasm of the oocyte by micropuncture of the zona pellucida. This procedure is done under a high quality inverted operating microscope. Micropipette suction is used to hold the oocyte in place while the spermatozoan is injected inside the cytoplasm of the oocyte (ooplasm) by an injecting pipette.

ICSI is very effective as compared to other micromanipulation techniques like SUZI (subzonal insemination).

Success: The fertilization rate through ICSI is about 60-70percent. However pregnancy rate through ICSI is 20-40 percent.

Summary

- Learning reproductive health helps us deal with the ever growing population problems as well as many social problems faced by the country like population growth, early marriages, child marriages, health of mother and child, common fetal abnormalities and reasons.
- Sexually transmitted diseases are on a rampant because of lack of knowledge of health of reproductive organs. An overview of these diseases helps us solve these issues and take precautionary measures when needed and also take treatment as and per needs.
- Amniocentesis is a very controversial issue which is banned in our country because of its wide and illegal use in causing female feticide which is responsible for the lowering sex ratio in our country.
- The misuse of amniocentesis will be stopped only if general awareness is made about the bad effects of the declining sex ratio.
- Infertility is another major issue amongst modern couples, which is increasing day by day, so a general idea is necessary for them to know what are the options present and which to choose from. The assisted reproductive techniques are the part of the chapter which solves the bigger problem of infertility.

EXERCISE

Objective Questions

Q.1 What is correct about test tube baby?

(A) Fertilization inside female genital tract and growth in test tube

(B) Rearing of prematurely born baby in incubator

(C) Fertilization outside and gestation inside womb of mother

(D) Both fertilization and development are effected outside the female genital tract

Q.2 Study of abnormalities by taken out the amniotic fluid of embryo is called

(A) Endoscopy (B) Amniocentesis

(C) Laparoscopy (D) Natal endoscopy

Q.3 Purpose of tubectomy is to prevent

(A) Egg formation (B) Embryonic development

(C) Fertilization (D) Coitus

Q.4 Vasectomy is

(A) Cutting of fallopian tube (B) Cutting of vasa deferens

(C) Factor of population growth (D) None of these

Q.5 An IUCD is

(A) Vasectomy (B) Copper T (C) Condom (D) All of the above

Q.6 A contraceptive is

(A) Condom, cervical cap and diaphragm

(B) Intrauterine device

(C) Pill

(D) All of the above

Q.7 A contraceptive pill contains

(A) Progesterone and estrogen

(B) Spermicidal salts

(C) Chemicals that cause automatic abortion

(D) Chemicals that prevent fertilization of ovum

Q.8 The partner responsible for sex of the child is

(A) Male (B) Female

(C) Both (A) and (B) (D) At times male or at times female

Q.9 MTP is

(A) Multi trade practices

(B) Malthusian treatise on population

(C) Multiple temporary frequency

(D) Medical termination of pregnancy

Q.10 A contraceptive pill prevents ovulation by

(A) Blocking fallopian tube

(B) Inhibiting release of FSH and LH

(C) Stimulating release of FSH and LH

(D) Causing immediate degeneration of released ovum

Q.11 First country of world which adopted family planning programme

(A) Japan (B) USA (C) India (D) Bangladesh

Q.12 Govt. sponsored “family planning programme“ was started in

(A) 1947 (B) 1952 (C) 1977 (D) 1956

Q.13 Saheli, a female antifertility pill is used

(A) Daily (B) Weekly (C) Quarterly (D) Monthly

Q.14 Which of the following is a nonsteroidal pill?

(A) Mala – D (B) Mala – N (C) Saheli (D) Quinesterol

Q.15 Which of the following contraceptive method make uterus unsuitable for implantation?

(A) Diaphragm (B) Condom (C) IUD (D) Natural method

Q.16 Which of the following is natural method of contraceptive?

(A) Sterilization (B) IUD (C) Diaphragm (D) Periodic abstinence

Q.17 Which method of contraception has high failure rate?

(A) Barrier method (B) IUD (C) Sterilization (D) Natural method

Q.18 Which of the following can be used as an emergency contraceptives?

(A) Mala –D (B) Saheli (C) i-Pills (D) Condom

Q.19 MTP is relatively safe during

(A) 12 week (B) 18 week (C) First trimester (D) Both (A) and (C)

Q.20 Which of the following method of contraceptive has least side effect?

(A) IUD (B) Pills (C) Coitus interruptus (D) Cervical cap

Q.21 Which of the following methods of contraception prevents ovulation?

(A) Pills (B) Depo-provera (C) Norplant (D) All of the above

Q.22 Which of the following is not a reproductive technique?

(A) ZIFT (B) GIFT (C) ELISA (D) IVF

Q.23 In which of the following methods zygote upto 32 blastomere is transferred into the uterus?

(A) IUT (B) ZIFT (C) GIFT (D) ICSI

Q.24 A contraceptive pill developed by the scientists of CDRI, Lucknow is?

(A) Mala – D (B) Mala – N (C) Saheli (D) Quinestrol

Q.25 Which of the following is banned in India?

(A) USG (B) Sterilization (C) Amniocentesis (D) IVF

Q.26 If male is impotent and female is normal then which of the following technique can be used?

(A) ICSI (B) ZIFT (C) GIFT (D) AI

Q.27 IVF technique includes

(A) GIFT (B) AI (C) IUT (D) All of the above

Q.28 Which contraceptive method provides some protection against HIV?

(A) IUD (B) Pills (C) Condoms (D) Periodic abstince

Q.29 Which of the following cannot be considered as an advantage of amniocentesis?

(A) Prenatal diagnostics

(B) Detection of biochemical abnormalities

(C) Detection of congenital defects

(D) Determination of sex to abort female fetus

Q.30 Population growth rate depends upon

(A) Birth rate (B) Death rate (C) Age-sex ratio (D) All of these

Q.31 Replacement level is the number of children a couple must produce to replace themselves so as to maintain population at zero growth level. The value of replacement level for developed countries is

(A) 2.7 (B) 2.1 (C) 1.9 (D) 1.2

Q.32 Which of the following defines the stage of demographic transition?

(A) Birth rate is higher than death rate

(B) Death rate is higher than birth rate

(C) Birth rate and death rate are equal

(D) Both (A) and (B)

Q.33 The average number of children that would be borne by a female during her lifetime is called

(A) Natality (B) Birth rate (C) Population growth rate (D) Total fertility rate

Q.34 Which of the following can be included under natural methods of birth control?

(A) Rhythm method (B) Coitus interruptus

(C) Lactational amenorrhea (D) All of these

Q.35 Which of the following contraceptive devices also protect against sexually transmitted diseases?

(A) Fern shield (B) Sponge (C) IUDs (D) LNG-20

Q.36 Which of the following chemicals can be used under chemical methods for contraception?

(A) Lactic acid (B) Boric acid (C) Citric acid (D) All of these

Q.37 Which of the following is/are hormone-releasing IUDs?

(A) Progestasert (B) Levonorgestrel

(C) Both (A) and (B) (D) Lippe's loop

Q.38 Which of the following can be included under emergency contraception?

(A) An antiprogesterone pill

(B) Insertion of IUD within 72 h of unprotected sexual contact

(C) Both (A) and (B)

(D) Vasectomy

Q.39 "Norplant" is the new form of birth control and it

(A) Allows ovulation but does not allow fertilization

(B) Makes the cervical mucus thin making sperm entry into the uterus difficult

(C) Has progestin as the active ingredient

(D) Is effective for a maximum of 1 year

Q.40 Which of the following is not included under barrier methods of birth control?

(A) Vaginal pouch (B) Diaphragm (C) Cervical cap (D) Implant

Q.41 Sexually transmitted diseases can get transmitted easily during the use of

(A) Diaphragm (B) Cervical cap

(C) Birth control pills (D) All of these

Q.42 The diaphragm is rubber-dome-shaped structure that stops the sperms from entering into

(A) Vestibule (B) Vagina

(C) Cervix (D) Both (A) and (B)

Q.43 Among the following methods, which one has the highest failure rate?

(A) Diaphragm with spermicide (B) Condom

(C) Intra-uterine device (D) Rhythm method

Q.44 In case of a person suffering from syphilis, chancre formation occurs during

(A) Primary stage (B) Secondary stage

(C) Tertiary stage (D) Neurosyphilis stage

Q.45 The “symptomless” period or latent period in case of syphilis may last for

(A) 1-5 weeks (B) 6-24 weeks (C) 4-12 weeks (D) 20 years

Q.46 Which of the following STD and its causative agent is not correctly matched?

(A) Genital warts : *Haemophilus ducrei*

(B) Syphilis : *Treponema pallidum*

(C) Genital herpes : Type II Herpes simplex virus (HSV-2)

(D) Trichomoniasis : *Trichomonas vaginalis*

Q.47 India was amongst the first countries in the world to initiate action plans and programs at a national level to attain reproductive health. These programs called “family planning” were initiated in_____ in India.

(A) 1951 (B) 1976 (C) 1901 (D) 1987

Q.48 All the following are uses of amniocentesis, but one is a misuse. Which one is it?

(A) The centers for genetic counseling offer amniocentesis on request to women for chromosome analysis.

(B) This technique has been developed for detecting fetal abnormalities by analyzing chromosomal defects.

(C) It is used to study the metabolic defects of fetus, e.g., PKU (phenyl ketonuria).

(D) It is done to examine the sex of the fetus leading to increasing female feticides.

Q.49 Which of the following is world's first non-hormonal oral contraceptive pill for females, developed by scientists at Central Drug Research Institute (CDRI) in Lucknow, India?

(A) Mala-D (B) Saheli (C) MORNING (D) PoP

Q.50 Which of the following is hormone-releasing IUD?

(A) Cu-T (B) LNG-20 (C) Multiload 375 (D) Implant

Q.51 Contraceptive pills are very effective with lesser side-effects and are well accepted by the females. They work by

(A) Inhibiting ovulation

(B) Inhibiting implantation

(C) Altering the quality of cervical mucus to prevent/ retard the entry of sperms

(D) All of these

Q.52 Which of the following is a once-a-week pill with very few side-effects and high contraceptive value?

(A) Mala-D (B) Saheli (C) Depo-Provera (D) Norplant

Q.53 A sterilization technique in females which blocks gamete transport and thereby prevents conception is

(A) Vasectomy (B) Copper-T (C) Condom (D) Tubectomy

Q.54 Surrogate mother is

(A) Mother without lactation

(B) Future mother with embryo implanted from another

(C) Carrying several embryos

(D) Artificially inseminated female

Q.55 The latest technique to produce a child is “GIFT.” The full form is

(A) Gametic internal fertilization and transfer

(B) Gametic intra-fallopian transfer

(C) Gametic inter-fallopian transfer

(D) General internal fallopian transfer

Q.56 Test-tube baby is the one

(A) Who is reared on artificial medium outside the womb.

(B) In which growth of human baby takes place inside the fallopian tube instead of uterus.

(C) In which the ova from wife/donor (female) and sperms from husband/donor (male) are induced to form zygote by IVF and then implanted in female.

(D) In which baby is born after artificial insemination.

Q.57 Which of the following is the most appropriate statement of infertility?

(A) Couple is unable to produce children in spite of unprotected sexual cohabitation.

(B) Infertility is defined as the inability to produce a viable offspring and is always due to defects/ abnormalities in the female partner.

(C) Infertility is due to immature sex organs.

(D) Infertility cannot be helped by ART.

Q.58 Which of the following STDs cannot be treated with antibiotics?

1. Gonorrhea	2. Syphilis	3. Chlamydia	4. Genital herpes
(A) (4) only	(B) (2) and (4)	(C) (3) and (4)	(D) (3) only

Q.59 At which stage of the ovarian cycle are mammalian eggs most likely to become fertilized?

(A) At the beginning of proliferative phase

(B) Immediately after ovulation

(C) During the middle of the secretory phase

(D) During the menstrual phase

Q.60 World Population Day is

(A) 11th July (B) 21st September (C) 7th April (D) 1st July

Q.61 MTPs are considered relatively safe up to_____of pregnancy.

(A) 12 weeks (B) 20 weeks (C) 25 weeks (D) 18 weeks

Q.62 Most of the sexually transmitted diseases are completely curable if detected early and treated properly, except

(A) Hepatitis-B (B) Genital herpes (C) HIV infections (D) All of these

Q.63 Which of the following causative agents of STDs can cross the placenta?

(A) Hepatitis-B (B) HIV (C) Syphilis (D) All of these

Q.64 Which of the following methods of birth control can cause excessive menstrual bleeding and pain?

(A) Condom (B) Cervical cap

(C) Oral contraceptive (D) Intra-uterine device

Q.65 Which of the following is one of the safest method of birth control?

(A) The rhythm method (B) Sterilization techniques

(C) Use of physical barriers (D) Termination of unwanted pregnancy

Q.66 Tubectomy is to prevent

(A) Coitus (B) Fertilization

(C) Egg formation (D) Embryonic development

Q.67 Preventive birth control measure is

(A) MTP

(B) Test-tube babies

(C) Preventing union of sperm and ovum

(D) Preventing sperms from entering uterus

Q.68 Which of the following method of birth control is effective, easy to use, and less-expensive?

(A) IUD (B) Condom (C) Implant (D) Diaphragm

Q.69 Which of the following method of contraception is effective only up to a maximum period of 6 months following parturition?

(A) Cortus interruptus (B) Lactational amenorrhea

(C) Periodic abstinance (D) Condoms

Q.70 Which of the following are included in barrier method?

(A) Condoms (B) Diaphrams

(C) Cervical caps and vault (D) All of these

Q.71 In oogenesis, haploid egg is fertilized by sperm at which stage?

(A) Ovum (B) Oogonium (C) Primary oocyte (D) Secondary oocyte

Q.72 The first polar body is formed at which stage of oogenesis?

(A) 1^{st} meiosis (B) 2^{nd} mitosis (C) 1^{st} mitosis (D) Differentiation

Q.73 Vitallogenesis occurs during the formation of

(A) Ootid in the fallopian tube (B) Oogonial cell in the Graafian follicle

(C) Secondary oocyte in the fallopian tube (D) Primary oocyte in the Graafian follicle

Q.74 Fetal ejection reflex in human females is induced by

(A) Release of oxytocin from pituitary (B) Fully developed fetus and placenta

(C) Differentiation of mammary glands (D) Pressure exerted by amniotic fluid

Q.75 Which of the following statements is correct?

(A) Hormone releasing IUD make uterus unsuitable for implantation

(B) IUDs are ideal contraceptives for females who want to delay pregnancy

(C) IUD is the most widely accepted method of contraception in India

(D) All the above

Q.76 Which of the following can be used as an emergency contraceptive to avoid possible pregnancy?

(A) Progestogens (B) IUD, within 72 h

(C) Diaphrams (D) (A) and (B)

Q.77 Which of the following statements is correct?

(A) MTP has a significant role in decreasing the population

(B) Government of India legalized MTP in 1977 with some strict conditions

(C) MTP is relatively safe during the first trimester

(D) All the above

Q.78 Infertility cases due to the inability of male partner to inseminate the female are corrected by

(A) ZIFT (B) GIFT (C) Artificial insemination (D) ICSI

Q.79 In vitro fertilization is a technique that involves the transfer of which one of the following into the fallopian tube?

(A) Either zygote or early embryo up to 8 cell stage

(B) Embryo only, up to 8 cell stage

(C) Embryo of 32 cell stage

(D) Zygote only

Q.80 Which of the following statement is not true with respect to tubectomy or tubal ligation?

(A) It is more difficult than vasectomy and is even more difficult to reverse.

(B) No ovulation occurs; hence, no fertilization is possible.

(C) It involves ligation of both fallopian tubes.

(D) The failure rate of this approach is almost zero percent.

Q.81 Which of the following hormone/s is/are maintained at high level during hormonal method of birth control?

(A) FSH (B) LH (C) Progesterone (D) Both (A) and (B)

Q.82 Injectable form of hormone-based contraceptive is

(A) Norplant (B) Depo-Provera (C) Mala-D (D) Saheli

Q.83 In the rhythm method of birth control, the couple refrains from intercourse

(A) One day before and after ovulation (B) Two days before and after ovulation

(C) Three days before and after ovulation (D) One week before and after ovulation

Q.84 Which of the following method is used during abortion?

(A) Vacuum aspiration (B) Infusion of a saline solution

(C) Scraping (D) All of these

Q.85 The action of which of the following hormone is blocked during the use of RU 486 (mifepristone)?

(A) FSH (B) LH (C) Progesterone (D) hCG

Q.86 Which of the following STD is not caused by a bacterium?

(A) Chlamydia (B) Gonorrhea (C) Syphilis (D) Genital herpes

Q.87 Which of the following cannot be taken as the symptom of a female suffering from gonorrhea?

(A) Inflammation of urethra with painful urination

(B) Discharge of pus from vagina

(C) Inflammation of uterine tubes

(D) Peritonitis or inflammation of the peritoneum

Q.88 Which of the following stage of syphilis is characterized by skin rash, fever, and aches in joints and muscles?

(A) Primary stage (B) Secondary stage

(C) Tertiary stage (D) Neurosyphiiis stage

Q.89 The use of which of the following contraceptive device has increased in recent years due to its additional benefit of protecting the user from contracting STDs and AIDS?

(A) Coitus interruptus (B) IUDs (intra-uterine-devices)

(C) Condoms (D) Vasectomy

Q.90 Which of the following have been found to be very effective as emergency contraceptives as they can be used to avoid possible pregnancy due to rape if given within 72 hours?

1. Administration of progestogens

2. Progestogen-estrogen combination

3. IUDs

4. Condoms

(A) (4) only (B) (1) and (2) (C) (1), (2), and (3) (D) (1), (2), (3), and (4)

Q.91 All the following statements about ZIFT are correct, but one is wrong. Which one is wrong?

(A) It is zygote intra-fallopian transfer (ZIFT)

(B) Zygote is transferred into the fallopian tube after IVF

(C) Early embryos up to 8 blastomeres can also be transferred into the fallopian tubes

(D) Embryos with more than 8 blastomeres are also transferred into the fallopian tubes

Q.92 If a person is suffering from severe male infertility, in which the ejaculate contains very few sperms (oligozoo- spermia) or even no live sperm (azoospermia), it can be overcome by_____. This should offer couples an alternative to using donor sperm.

(A) GIFT (B) ZIFT (C) ICSI (D) IVF

Q.93 Which of the following sexually transmitted diseases is caused by a protozoan?

(A) Gonorrhoea (B) Trichomoniasis

(C) Chlamydiasis (D) Syphilis

Q.94 Which of the following contraceptive is an injectable form of the “birth control pill hormones” that prevent ovulation?

(A) Norplant (B) Depo-Provera (C) Saheli (D) Mala-D

Q.95 Which of the following STDs is caused by the human papilloma virus (HPV) and is transmitted through intimate contact with infected person?

(A) Genital herpes (B) Genital warts (C) AIDS (D) Chlamydia

Q.96 Norplant is

(A) A kind of plant
(B) A fertilizer factory
(C) A contraceptive
(D) A power generation plant

Q.97 Which of the following is an important detection technique for syphilis?

(A) Gram staining of the discharge
(B) Nucleic acid hybridization, PCR
(C) Antibody detection, e.g., VDRL
(D) Microscopic examination of culture

Q.98 Which of the following virus has dsDNA as the genetic material and is transmitted mainly by sexual contact?

(A) Hepatitis-A (B) Hepatitis-B (C) Hepatitis-C (D) All of these

Q.99 Which of the following drug is progesterone antagonist and acts as an abortion drug?

(A) Saheli (B) Mifepristone (C) Mala-N (D) Depo-Provera

Q.100 An important function of progesterone is

1. To prepare uterus for pregnancy
2. Implantation of embryo
3. Maintenance of pregnancy
4. To stimulate ADH

Codes:

(A) (1) and (2) are correct
(B) (2) and (4) are correct
(C) (1) and (3) are correct
(D) (1), (2), and (3) are correct

Q.101 Menstrual cycle is controlled by

1. Estrogen and progesterone of ovary
2. FSH of pituitary
3. FSH and LH of pituitary
4. Oxytocin hormone

Codes:

(A) (1) and (2) are correct
(B) (2) and (4) are correct
(C) (1) and (3) are correct
(D) (1), (2), and (3) are correct

Q.102 Which hormone level reaches its peak during the luteal phase of menstrual cycle?

(A) Estrogen
(B) Progesterone
(C) Luteinizing hormone
(D) Follicle stimulating hormone

Q.103 The 32-cells stage of the human embryo is

(A) Smaller than the fertilized egg

(B) Of the same size as the fertilized egg

(C) Two times the size of the fertilized egg

(D) Four times the size of the fertilized egg

Q.104 Which one of the following is the correct matching of events occurring during menstrual cycle?

(A) Menstruation : Breakdown of myometrium and ovum not fertilized

(B) Ovulation : LH and FSH attain peak level and sharp fall in the secretion of progesterone

(C) Proliferative : Rapid regeneration of myometrium and maturation of Graafian phase follicle

(D) Corpus luteum : Development of secretory phase and increased secretion of progesterone

Q.105 RCH stands for

(A) Routine check-up of health

(B) Reproduction cum hygiene

(C) Reversible contraceptive hazards

(D) Reproduction and child healthcare

Q.106 What is true about “Saheli”?

(i) Developed at CDRL, Lucknow

(ii) Contains a steroidal preparation

(iii) “Once-a-week” pill

(iv) Many side-effects

(v) High contraceptive value

(vi) Very few side-effects

(vii) Low contraceptive value

(A) (i), (ii), (iii), (v), (vi)

(B) (i), (iii), (v), (vi)

(C) (ii), (iii), (iv), (v)

(D) (i), (iii), (iv), (v)

Previous Years' Questions

Q.1 Aminocentesis is ***[CPMT 94]***

(A) Analysis of chemical composition of fluids of pregnant woman

(B) Withdrawal of allantoic fluid from pregnant women

(C) An in vitro diagnosis

(D) Culturing of cells and study of metaphase chromosomes from amniotic fluid to identify chromosomal abnormality

Q.2 Which one is not legitimate for reducing birth rate? ***[MP PMT 95]***

(A) Ban on marriages (B) MTP

(C) Use of contraceptives (D) Late marriages

Q.3 Oral contraceptives contain ***[CBSE 1998]***

(A) Progesterone (B) LH

(C) Oxytocin (D) Sterols

Q.4 Amniocentesis is used for determining ***[CBSE 1997]***

(A) Heart diseases (B) Brain disease

(C) Hereditary disease of embryo (D) All the above

Q.5 Most important component of oral contraceptive is ***[CBSE 1995]***

(A) Thyroxine (B) LH

(C) Progesterone (D) AH

Q.6 Tubectomy, a method of population control is performed on ***[JK CMEE 2000]***

(A) Both males and females (B) Males only

(C) Females only (D) Only pregnant females

Q.7 Which is related to males? ***[MANIPAL 2001]***

(A) I.U.C.D. (B) Tubectomy (C) Vasectomy (D) None of the above

Q.8 Copper T ***[MANIPAL 2001]***

(A) Suppresses fertilization of coercing ovum (B) Acts as barrier

(C) Prevents implantation of Blastocyst (D) Prevents cleavage

Q.9 Consider the statements given below regarding contraception and answer as directed thereafter ***[CBSE 2008]***

(1) Medical Termination of Pregnancy MTP during first trimester is generally safe

(2) Generally chances of conception are nil until mother breast – feeds the infant upto two years

(3) Intrauterine devices like copper T are effective contraceptives

(4) Contraception pills may be taken upto one week after coitus to prevent conception

Which two of the above statement are correct?

(A) 1,3 (B) 1,2 (C) 2,3 (D) 3,4

Q.10 Given below are four methods (1-4) and their modes of action (a-d) inachieving contraception. Select their correct matching from the four options that follow ***[CBSE 2008]***

Method	**Mode of Action**
1. The pill	(a) prevents sperms reaching cervix
2. Condom	(b) Prevents implantation
3. Vasectomy	(c) Prevents ovulation
4. Copper T	(d) Semen contains no sperms

Matching

(A) 1-(c), 2-(d), 3-(a), 4-(b) (B) 1-(b), 2-(c), 3-(a), 4-(d)

(C) 1-(c), 2-(a), 3-(d), 4-(b) (D) 1-(d), 2-(a), 3-(b), 4-(c)

Q.11 Test tube baby means a baby born when ***[CBSE 2003]***

(A) It is developed in a test tube

(B) It is developed through tissue culture method

(C) The ovum is fertilized externally and later implanted in the uterus

(D) It develops from a non-fertilized egg

Q.12 What is the work of copper T? ***[CBSE 2000]***

(A) To inhibit ovulation (B) To inhibit fertilization

(C) To inhibit implantation of blastocyst (D) To inhibit gametogenesis

Q.13 Which substance can be used as male contraceptive in future? ***[CBSE 1999]***

(A) FSH (B) LH (C) Testosterone (D) Progesterone

Q.14 Which of the following statements is correct with reference to a test-tube baby? ***[AIPMT 1994]***

(A) Fertilization of egg is completed outside the body; the fertilized egg is then placed in the womb of the mother where gestation is completed.

(B) Fertilization of egg is completed in the female genital tract. It is then taken out and grown in a large test tube.

(C) A prematurely born baby is reared in an incubator.

(D) Fertilization of egg and growth of embryo is completed in a large test tube.

Q.15 A test-tube baby means ***[AIPMT 1996]***

(A) Fertilization and development both in uterus

(B) Fertilization in vitro and then transplantation in uterus

(C) A baby grown in test tube

(D) Fertilized and developed embryo in test tube

Q.16 What is the work of copper-T? ***[AIPMT 2000]***

(A) To inhibit ovulation

(B) To inhibit fertilization

(C) To inhibit implantation of blastocyst

(D) To inhibit gametogenesis

Q.17 What is the work of progesterone which is present in oral contraceptive pills? ***[AIPMT 2000]***

(A) To inhibit ovulation

(B) To check oogenesis

(C) To check entry of sperms into cervix and to make them inactive

(D) To check sexual behavior

Q.18 Which is showing accurate pairing? ***[AIPMT 2000]***

(A) Syphilis – *Treponema pallidum*

(B) AIDS – *Bacillus conjugalis*

(C) Gonorrhoea – *Leishmania donovani*

(D) Typhoid – *Mycobacterium leprae*

Q.19 Copper releasing IUD is ***[HP PMT 2012]***

(A) Diaphragm (B) Multiload 375 (C) LNG - 20 (D) Saheli

Q.20 Given below are four methods (1)-(4) and their modes of action (i)-(iv) in achieving contraception. Select their correct matching from the four options that follow: ***[AIPMT 2008]***

Method	Mode of action
1. The pill	(i) Prevents sperms reaching cervix
2. Condom	(ii) Prevents implantation
3. Vasectomy	(iii) Prevents ovulation
4. Copper-T	(iv) Semen contains nosperms

(A) 1-(iii), 2-(iv), 3-(i), 4-(ii) (B) 1-(ii), 2-(iii), 3-(i), 4-(iv)

(C) 1-(iii), 2-(i), 3-(iv), 4-(ii) (D) 1-(iv), 2-(i), 3-(ii), 4-(iii)

Q.21 Consider the statements given below regarding contraception and answer as directed thereafter. ***[AIPMT 2008]***

1. Medical termination of pregnancy (MTP) during first trimester is generally safe.
2. Generally, the chances of conception are nil until mother breast-feeds the infant up to two years.
3. Intra-uterine devices such as copper-T are effective contraceptives.
4. Contraception pills may be taken up to 1 week after coitus to prevent conception.

Which two of the above statements are correct?

(A) (1), (3) (B) (1), (2) (C) (2), (3) (D) (3), (4)

Q.22 Amniocentesis is ***[AIIMS 2000]***

(A) Digestion of amino acid

(B) Conversion of glucose to amino acids

(C) Taking out of cells near the fetus

(D) Killing of child before birth

Q.23 What is the function of copper-T? ***[BHU 2002]***

(A) Checks mutation (B) Stops zygote formation

(C) Stops fertilization (D) Stops obliteration of blastocoel

Q.24 AIDS disease was first reported in ***[DPMT 1993]***

(A) Russia (B) USA (C) Germany (D) France

Q.25 Tubectomy prevents pregnancy by ***[DPMT 2000]***

(A) Preventing fertilization

(B) Preventing ovulation

(C) Altering FSH levels in ovary

(D) Altering LH level in ovary

Q.26 Progesterone pill helps in preventing pregnancy by not allowing ***[DPMT 2003]***

(A) Ova formation (B) Fertilization (C) Implantation (D) None of these

Q.27 Oral contraceptive pills function by ***[DPMT 2008]***

(A) Inhibiting ovulation

(B) Stimulating ovulation

(C) Stimulating the motility and secretory activity ofoviduct

(D) None of the above

Q.28 The most important component of oral contraceptive pillsis ***[UPCPMT 1999]***

(A) Progesterone-estrogen (B) Growth hormone

(C) Thyroxine (D) Luteinizing hormone

Q.29 Amniocentesis is a technique to ***[UPCPMT 2009]***

(A) Determine any disease in heart

(B) Determine any hereditary disease in the embryo

(C) Know about the disease of brain

(D) Grow cell on culture medium

Q.30 Which of the following is a technique of direct introduction of gametes into the oviduct? ***[Manipal 2004]***

(A) MTS (2) ET (C) IVF (D) POST

Q.31 Syphilis is caused by ***[Manipal 2004]***

(A) *Treponema pallidum* (B) *Plasmodium*

(C) *Neisseria gonorrhoeae* (D) *Entamoeba histolytica*

Q.32 Gonorrhoea is caused by ***[Manipal 2005]***

(A) *Treponema pallidum* (B) *Entamoeba gingivalis*

(C) *Mycobacterium leprae* (D) *Neisseria gonorrhoeae*

Q.33 Which is non-invasive technique of genetic counseling? ***[AMU 1996]***

(A) Amniocentesis (B) Chorionic biopsy

(C) Fetal blood sampling (D) Ultrasonography

Q.34 Which one of the following organisms cause syphilis? ***[AMU 1999]***

(A) *Neisseria gonorrhoeae* (B) *Treponema pallidum*

(C) *Pasteurella pestis* (D) *Clostridium botulinum*

Q.35 The common means of transmission of AIDS is ***[AMU 2001]***

(A) Sexual intercourse (B) Blood transfusion

(C) Placental transfer (D) All of these

Q.36 AIDS is transmitted ***[AMU 2003]***

(A) Sexually (B) Parenterally (C) Vertically (D) All of these

Q.37 Which is the causal agent for syphilis? ***[AMU 2004]***

(A) *Haemophilus durei* (B) *Treponema pallidum*

(C) *Chlamydia trachomatis* (D) All of the above

Q.38 Component of oral pills is ***[AFMC 2009]***

(A) Progesterone (B) Oxytocin

(C) Relaxin (D) None of these

Q.39 Contraceptive oral pills help birth control by ***[Karnataka 1997]***

(A) Preventing ovulation

(B) Killing the sperms

(C) Forming barriers between sperms-ova

(D) Killing the ova

Q.40 GIFT involves transfer of ***[Karnataka 1997]***

(A) A mixture of sperms and ova into the uterus

(B) Embryo into the uterus

(C) A mixture of sperms and ova into the fallopian tube

(D) Zygote into the fallopian tube

Q.41 In the production of test-tube babies ***[Karnataka 2002]***

(A) Fertilization and fetus formation is external

(B) Fertilization and fetus formation is internal

(C) Fertilization is internal and fetus formation is external

(D) Fertilization is external and fetus formation is internal

Q.42 The first case of IVF-ET technique success was reportedby ***[Karnataka 2003]***

(A) Louis Joy Brown and Banting Best

(B) Patrick Steptoe and Robert Edwards

(C) Robert Steptoe and Gilbert Brown

(D) Baylis and Starling Taylor

Q.43 Which of the following is a mechanical barrier used inbirth control? ***[Karnataka 2004]***

(A) Loop (B) Daikon shield (C) Copper-T (D) Diaphragm

Q.44 Which of the following birth control measure can be considered as the safest? ***[Karnataka 2006]***

(A) The rhythm method (B) The use of physical barriers

(C) Termination of unwanted pregnancy (D) Sterilization techniques

Q.45 A sexually transmitted disease symptomized by the development of chancre on the genitals is caused by the infection of ***[Karnataka 2008]***

(A) *Treponema pallidum* (B) *Neisseria gonorrhoeae*

(C) Human immune deficiency virus (D) Hepatitis B virus

Q.46 Surgical removal of vas deferens is called ***[J & K 2001]***

(A) Tubectomy (B) Vasectomy

(C) Vasectolysis (D) None of these

Q.47 Amniocentesis is a technique used to ***[J & K 2003]***

(A) Determine errors in amino acid metabolism in embryo

(B) Pinpoint specific cardiac ailments in embryo

(C) Determine any hereditary genetic abnormality in embryo

(D) All of the above

Q.48 Oral contraceptives are prescribed in females to check ***[J & K 2004]***

(A) Entry of sperms in vagina (B) Implantation

(C) Ovulation (D) Fertilization

Q.49 Which one of the following is a sexually transmitted disease? ***[J & K 2004]***

(A) Cancer (B) Syphilis

(C) Diphtheria (D) Myocarditis

Q.50 The status of the fetus for genetic counseling can be determined by ***[J & K 2006]***

(A) Amniocentesis (B) Microscopy

(C) Aminoacidopathy (D) Fetocentesis

Q.51 The test which is misused for the identification of an unborn baby is ***[J & K 2007]***

(A) Clotting test (B) Amniocentesis

(C) Erythroblastosis (D) Angiogram

Q.52 Amniocentesis detects ***[Punjab 2000]***

(A) Deformity in brain (B) Deformity in heart

(C) Hereditary disease (D) All of these

Q.53 Which of the following is a method of birth control? ***[Punjab 2007]***

(A) IUD (B) GIFT (C) HTF (D) IVF-ET

Q.54 Tubectomy ***[AMU 1994]***

(A) Prevents implantation (B) Prevents fetal development

(C) Prevents fertilization (D) All of the above

Q.55 The present population of the world is about ***[CBSE 1997]***

(A) 500 million (B) 100 million (C) 15 billion (D) 6 billion

Q.56 GIFT is ***[MAHE 2002]***

(A) Embryo implantation after in vivo fertilization

(B) Sperm injection for in vivo fertilization

(C) Embryo implantation after in vitro fertilization

(D) Egg implantation for in vitro fertilization

Q.57 Copper-T acts by ***[Kerala 2001]***

(A) Suppression of fertilization by fanning a membrane

(B) Disturbing the site of implantation of blastocyst

(C) Acting as a barrier

(D) None of these

Q.58 Each couple should produce only two children which will help in ***[AMU 1998]***

(A) Checking pollution (B) Stabilizing the ecosystem

(C) Fertility of soil (D) Improving food-web

Q.59 Amniocentesis has helped ***[Haryana 1998]***

(A) The childless couples

(B) In establishment of biological superiority of females

(C) In waste of money

(D) None of these

Q.60 The technique which makes use of amniotic fluid for thedetection of prenatal disorder is called ***[MP 1993]***

(A) Laparoscopy (B) Amniocentesis (C) Endoscopy (D) Ultrasound

Q.61 *In vitro* fertilization is a technique that involves the transfer of which one of the following into the fallopian tube? ***[CBSE 2010]***

(A) Zygote only

(B) Embryo only, up to 8 cell stage

(C) Either zygote or early embryo up to 8 cell stage

(D) Embryo of 32 cell stage

Q.62 The permissible use of the technique amniocentesis is for ***[AIPMT Pre 2010]***

(A) Detecting any genetic abnormality

(B) Detecting sex of the unborn fetus

(C) Artificial insemination

(D) Transfer of embryo into the uterus of a surrogate mother

Q.63 Cu ions released from copper-releasing intra-uterine devices (IUDs) ***[CBSE 2010]***

(A) Prevent ovulation

(B) Make uterus unsuitable for implantation

(C) Increase phagocytosis of sperms

(D) Suppress sperm motility

Q.64 Which of the following cannot be considered as assisted reproductive technology? ***[HPPMT 2010]***

(A) In vitro fertilization (IVF)

(B) Medical termination of pregnancy (MTP)

(C) Gamete intra-fallopian transfer (GIFT)

(D) Intra-cytoplasmic sperm injection (ICSI)

Q.65 The population limited to a particular geographic area is called as ***[J and K CET 2012]***

(A) Pandemic (B) Endemic (C) Alien (D) Natural

Q.66 The Test-Tube Baby Program employs which one of thefollowing techniques? ***[AIPMT Pre 2012]***

(A) Intra-uterine insemination (IUI)

(B) Gamete intra-fallopian transfer (GIFT)

(C) Zygote intra-fallopian transfer (ZIFT)

(D) Intra-cytoplasmic sperm injection (ICSI)

Q.67 One of the legal methods of birth control is ***[NEET 2013]***

(A) By abstaining from coitus from day 10 to 17 of the menstrual cycle

(B) By having coitus at the time of day break

(C) By premature ejaculation during-coitus

(D) Abortion by taking an appropriate medicine

Q.68 Artificial insemination means ***[NEET 2013]***

(A) Transfer of sperms of husband to a test tube containing ova

(B) Artificial introduction of sperms of a healthy donor into the vagina

(C) Introduction of sperms of a healthy donor directly into the ovary

(D) Transfer of sperms of a healthy donor to a test tube containing ova

ANSWER KEY

Objective Questions

Q.1 C	**Q.2** B	**Q.3** C	**Q.4** B	**Q.5** B	**Q.6** D
Q.7 A	**Q.8** A	**Q.9** D	**Q.10** B	**Q.11** C	**Q.12** B
Q.13 B	**Q.14** C	**Q.15** C	**Q.16** D	**Q.17** D	**Q.18** C
Q.19 C	**Q.20** C	**Q.21** D	**Q.22** C	**Q.23** A	**Q.24** C
Q.25 C	**Q.26** D	**Q.27** C	**Q.28** C	**Q.29** D	**Q.30** D
Q.31 B	**Q.32** C	**Q.33** D	**Q.34** D	**Q.35** A	**Q.36** D
Q.37 C	**Q.38** C	**Q.39** C	**Q.40** D	**Q.41** D	**Q.42** C
Q.43 D	**Q.44** A	**Q.45** D	**Q.46** A	**Q.47** A	**Q.48** D
Q.49 B	**Q.50** B	**Q.51** D	**Q.52** B	**Q.53** D	**Q.54** B
Q.55 B	**Q.56** C	**Q.57** A	**Q.58** A	**Q.59** B	**Q.60** A
Q.61 A	**Q.62** D	**Q.63** D	**Q.64** D	**Q.65** B	**Q.66** B
Q.67 C	**Q.68** B	**Q.69** B	**Q.70** D	**Q.71** D	**Q.72** A
Q.73 D	**Q.74** B	**Q.75** D	**Q.76** D	**Q.77** D	**Q.78** C
Q.79 A	**Q.80** B	**Q.81** C	**Q.82** B	**Q.83** C	**Q.84** D
Q.85 C	**Q.86** D	**Q.87** A	**Q.88** B	**Q.89** C	**Q.90** C
Q.91 D	**Q.92** C	**Q.93** B	**Q.94** B	**Q.95** B	**Q.96** C
Q.97 C	**Q.98** B	**Q.99** B	**Q.100** D	**Q.101** D	**Q.102** B
Q.103 B	**Q.104** D	**Q.105** D	**Q.106** B		

Previous Years' Questions

Q.1 D	**Q.2** A	**Q.3** A	**Q.4** C	**Q.5** C	**Q.6** C
Q.7 C	**Q.8** C	**Q.9** A	**Q.10** C	**Q.11** C	**Q.12** C
Q.13 D	**Q.14** A	**Q.15** B	**Q.16** B	**Q.17** A	**Q.18** A
Q.19 B	**Q.20** C	**Q.21** A	**Q.22** C	**Q.23** C	**Q.24** B
Q.25 A	**Q.26** A	**Q.27** A	**Q.28** A	**Q.29** B	**Q.30** C
Q.31 A	**Q.32** D	**Q.33** D	**Q.34** B	**Q.35** D	**Q.36** D
Q.37 B	**Q.38** A	**Q.39** A	**Q.40** C	**Q.41** D	**Q.42** B
Q.43 D	**Q.44** D	**Q.45** A	**Q.46** B	**Q.47** C	**Q.48** C
Q.49 B	**Q.50** A	**Q.51** B	**Q.52** D	**Q.53** A	**Q.54** C
Q.55 D	**Q.56** B	**Q.57** B	**Q.58** B	**Q.59** B	**Q.60** B
Q.61 C	**Q.62** A	**Q.63** D	**Q.64** B	**Q.65** B	**Q.66** C
Q.67 D	**Q.68** B				