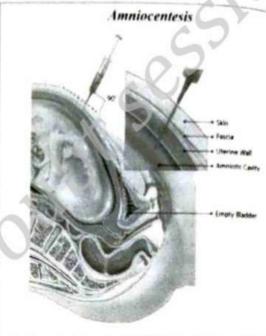
Subtopics

- 2.0 Introduction
- ©21 Asexual Reproduction in Animals
 - 2.2 Sexual Reproduction in Animals
 - 2.3 Menstrual Cycle (Ovarian Cycle)
 - 2.4 Gametogenesis
 - 2.5 Fertilization/Syngamy
 - 2.6 Embryonic development
 - 2.7 Pregnancy
 - 2.8 Placenta
 - 2.9 Parturition
 - 2.10 Lactation
 - 2.11 Reproductive Health
 - 2.12 Birth Control
 - 2.13 Sexually Transmitted Diseases (STDs)
 - 2.14 Infertility



Amniocentesis is a pre-natal diagnostic test used for the detection of chromosomal abnormalities and foetal infections. It can also be used for sex determination and hence has legal restrictions in some countries.



Quick Seview

Reproduction

It is defined as the biological process of formation of new life.

Asexual reproduction

Common method of reproduction among lower animals

Does not involve meiosis, gamete formation and fusion

- Gemmule formation: Internal bud called gemmule is formed only in sponges. It is formed to unfavourable conditions of water and temperature
- Budding: Simple method of asexual reproduction occuring in favourable conditions

Sexual reproduction

Process which involves production of offsprings by the formation and fusion of gametes

The process of reproduction in humans occurs in sequential steps such as

- Gametogenesis
- Insemination
- Internal fertilization
- Zygote formation
- Embryogenesis
- Gestation
- Parturition



Menstrual cycle

- · Characteristic feature of primates including humans
- Involves cyclic changes in the ovary and female reproductive tract, mainly in the uterus.
- It is a 28 day cycle. The cycle is divided into 4 phases of Menstrual cycle:
- Menstrual phase → Average 3 to 7 days: Proliferative (Follicular) → 5th 13th day
- Ovulatory → 14th day: Secretory (Luteal) → 15th 28th day

HUMAN REPRODUCTION

Male Reproductive System

- Testis → (Primary sex organ) → Produce sperms and secrete testosterone.
- Penis → Copulatory organ.
- Accessory ducts → Rete testis, Vasa efferentia, Epididymis, Vasa deferentia.
- Accessory glands → Ejaculatory ducts, Seminal vesicles, Prostate gland, Cowper's glands.

Female Reproductive System

- Ovaries (Primary sex organ) → Produce ova and secrete estrogen and progesterone
- Oviducts Fallopian tubes (Site of fertilization)
- Uterus (site of implantation of embryo); Vagina (Copulatory as well as birth canal).
- External genitalia

 Labia majora, labia minora, clitoris, mons pubis, hymen, vestibule.
- Accessory glands

 Vestibular (Bartholin's) glands, Mammary glands,

Spermatogenesis

Sperm

Oogenesis

Ovum

Fertilization

- It is the fusion of haploid male gamete (Spermatozoa) and haploid female gamete (ovum) to form diploid zygote.
- Takes place in ampulla of fallopian tube.
- It restores diploidy in zygote (2n).
- Stimulates zygote to undergo further development.
 Occurs in four steps:
- Approach of sperm to ovum.
- · Penetration of sperm into ovum.
- Activation of ovum.
- · Fusion of gametic nuclei.

Embryonic

- Cleavage → Early mitotic divisions of zygote into hollow multicellular blastula.
- Blastulation → Process of formation of the hollow and multicellular blastocyst.
- Implantation → Attachment of blastocyst on the endometrium of uterus.
- Gastrulation → Process of formation of gastrula from the blastocyst

Pregnancy

- It is the condition of carrying one or more embryos in the uterus.
- Lasts for about 266 days from fertilization or 280 days from LMP. Three trimesters of pregnancy (3 months each).
- First → Foetus 5 cm long
- Second → Foetus 30 cm long
- Third (Final) → Foetus 50 cm long; 3 - 4 kgs

Parturition

- It is the process of giving birth to a baby.
- Induced by oxytocin and relaxin.
 3 stages of Parturition:
- First (Dilation) → Lasts upto few hours
- Second (Expulsion) → 20 mins
- Third (Placental) → 10 45 mins

Lactation

- Secretion of milk from mammary glands after pregnancy.
- Colostrum is milk produced during the initial few days of lactation.
- It is rich in proteins, lactose and contains mother's antibodies which provides passive immunity to the new born baby.

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Sexually Transmitted Diseases (STDs)

- Diseases or infections which are transmited through sexual intercourse.
- Also called Veneral diseases (VD) or Reproductive Tract Infections (RTI).
- Syphilis → Treponema pallidum
- Gonorrhoea → Neisseria gonorrhoeae

Medical Termination of Pregnancy (MTP)

- It is the termination of pregnancy before foetus becomes viable.
- It is used to get rid of unwanted pregnancies or in defective development of foetus.
- It is safe during first trimester of pregnancy.

Amniocentesis

- Process of withdrawing amniotic fluid from pregnant mother's uterus
- Helps in checking chromosomal defects in foetus.

REPRODUCTIVE HEALTH

Need for Reproductive Health

- To eradicate myths and misconceptions about sex related aspects from the minds of people.
- To prevent STDs.
- To give proper information about safe and hygienic sexual practices.
- · Birth control.
- Pre-natal care of mother and child.
- Make people aware about the problems of population explosion, sex abuses and sex-related crimes.

In vitro Fertilization (IVF)

- Also called Test tube baby programme.
- Fusion of gametes take place outside the female body in laboratory conditions.
- Zygote is developed till morula stage and embryo is introduced in the uterus where it develops into a baby.

Birth Control Methods

Temporary:

- · Safe Period (Rhythm Method)
- · Coitus interruptus
- Spermicides → Males
- Condoms → Males
- Diaphragm and Cervical cap → Females
- Intrauterine contraceptive device (IUCD)→Females
- Birth control pills → Females
- Skin implants → Females
 Permanent:
- Vasectomy → Males
- Tubectomy → Females

Zygote Intra-fallopian Tube Transfer (ZIFT)

- Zygote or blastocyst upto 8 blastomeres is transferred into fallopian tube.
- Embryo moves to the uterus, gets implanted and continues further development.

Gamete Intra-fallopian Tube Transfer (GIFT)

- Ova and sperms directly injected into regions of oviduct.
- Fertilization produces blastocyst which enters the uterus, via. normal route.
- Success rate of about 30%.

Techniques