

Reproductive Health

CASE STUDY / PASSAGE BASED QUESTIONS

1

Read the following and answer any four questions from 1(i) to 1(v) given below:

Population is defined as the total number of individuals of a species present in a particular area at a given time. The scientific study of human population is called demography. The rapid increase in population over a relatively short period is called population explosion. Four basic processes are involved in increase or decrease in the population size. Population shows two types of growth; exponential and logistic.

- (i) Which of the following factors are responsible for population explosion?
- Decrease in number of people of reproducible age
 - Decline in infant mortality rate
 - Increase in maternal mortality rate
 - Rapid decline in death rate
- (a) A and B (b) B and C
(c) B and D (d) A and D
- (ii) What is the shape of curve showing logistic growth?
- Sigmoid
 - J-shape
 - Linear
 - Hyperbola
- (iii) What is immigration?
- Number of individuals of the population who left the habitat.
 - Number of individuals that have come into the habitat.
 - Number of individuals of a species per unit area at given time.
 - Number of births per 1000 individuals.
- (iv) Equation of Verhulst-Pearl logistic growth is
- $\frac{dN}{dt} = rN$
 - $\frac{dN}{dt} = \frac{K - N}{k}$
 - $\frac{dN}{dt} = rN \left(\frac{K - N}{K} \right)$
 - $\frac{dN}{dt} = \left(1 - \frac{N}{K} \right) r$
- (v) Which of the following contributes to decrease in population?
- Fertility
 - Natality
 - Social mobility
 - Emigration

Syllabus

Need for reproductive health and prevention of Sexually Transmitted Diseases (STDs); birth control - need

and methods, contraception and medical termination of pregnancy (MTP); amniocentesis; infertility and assisted reproductive technologies - IVF, ZIFT, GIFT (elementary idea for general awareness).

Read the following and answer any four questions from 2(i) to 2(v) given below:

Over population causes number of family problems. Strategies like birth control methods help to control population explosion. Natural methods of birth control do not involve medications or devices to prevent pregnancy but rather rely on behavioural practices and/or making observations about menstrual cycle.

- (i) Which method helps in contraception by temporary absence of sex?
- (a) Coitus interruptus (b) Withdrawal method
(c) Rhythm method (d) Lactational amenorrhea method
- (ii) **Assertion :** The effectiveness of coitus interruptus method is limited.
Reason : Some sperms may pass into vagina before ejaculation.
- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true but reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.
- (iii) Why is lactational amenorrhea effective for about 4-5 months after parturition?
- (a) Ovulation occurs on about the 14th day of menstruation.
(b) Ovulation does not occur during intense lactation.
(c) This method inhibits mobility of sperms.
(d) Both (b) and (c)
- (iv) Which fact is not the basis of periodic absence method of birth control?
- (a) Ovum remains alive for about 1-2 days.
(b) Ovulation occurs on about 14th day of menstruation.
(c) Sperms survive for about 3 days.
(d) Alteration in uterine endometrium
- (v) On which days of menstrual cycle should coitus be avoided to prevent fertilisation?
- (a) 10-17 (b) 6-13 (c) 1-5 (d) 15-28

Read the following and answer any four questions from 3(i) to 3(v) given below:

Intrauterine devices are most widely accepted methods of contraception. These are used by females and are inserted by doctor or nurses in the uterus through vagina. However these devices are not recommended for those who eventually intend to conceive.

- (i) How does CuT prevent conception?
- (a) Cu ions make uterus unsuitable for implantation.
(b) Cu ions make cervix hostile to the sperms.
(c) Cu ions suppress sperms motility.
(d) Cu ions inhibit ovulation.
- (ii) Which of the following IUDs makes uterus unsuitable for implantation?
- (a) LNG-20 (b) Multiload 375 (c) Cu7 (d) Lippes loop

(iii) Identify the correct statement for IUDs.

- (a) They slowly release synthetic progesterone in the body.
- (b) They increase phagocytosis of sperms within the uterus.
- (c) They block entry of sperms through the cervix.
- (d) Both (b) and (c)

(iv) Select the correct matched pair.

- (a) Hormone releasing IUD – LNG-20
- (b) Non-medicated IUD – Progestasert
- (c) Copper releasing IUD – Lippes loop
- (d) None of these

(v) **Assertion :** IUDs can cause excess menstrual bleeding and pain.

Reason : IUDs can perforate uterus.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
- (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
- (c) Assertion is true but reason is false.
- (d) Both assertion and reason are false.

4

Read the following and answer any four questions from 4(i) to 4(v) given below:

A 23 year old Sahil has been diagnosed with an infection of reproductive tract caused by bacteria. He complains about burning sensation during urination, pus-containing discharge and pain around genitalia. This infection has incubation period of 2-5 days but can be cured.

(i) From which disease is Sahil suffering?

- (a) Chlamydiasis
- (b) Herpes
- (c) Gonorrhoea
- (d) Syphilis

(ii) Which among the following reproductive tract infections is transmitted by bacteria?

- (a) Trichomoniasis
- (b) Chancroid
- (c) Genital warts
- (d) Both (a) and (b)

(iii) Which mode of treatment would be useful for Sahil?

- (a) Cryosurgery
- (b) Use of *Podophyllum* preparation
- (c) Use of antibiotic ampicillin
- (d) It cannot be treated.

(iv) What technique was used to diagnose Sahil's disease?

- (a) Gram staining of discharge and culture
- (b) ELISA Test
- (c) Antibody detection
- (d) Antigen test

(v) Find the odd one out.

- (a) *Treponema pallidum*
- (b) *Neisseria gonorrhoeae*
- (c) *Haemophilus ducreyi*
- (d) *Trichomonas vaginalis*

5

Read the following and answer any four questions from 5(i) to 5(v) given below:

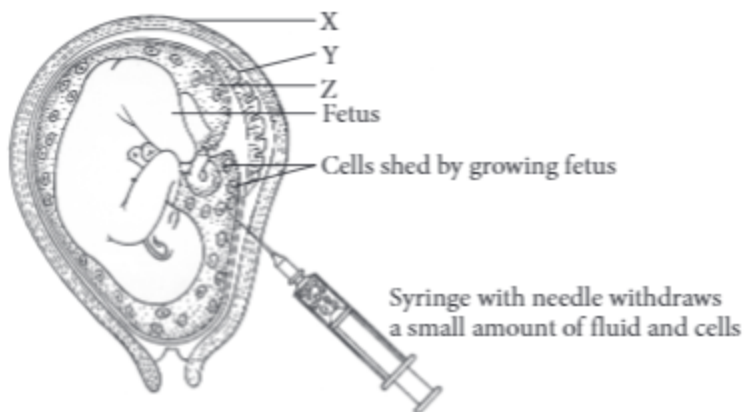
A young couple married for 5 years is unable to bear a child inspite of not practicing any birth control method. Upon consultation, doctor advised them an assisted reproductive technology involving transfer of gametes into oviducts.

- (i) Identify the technique adopted by the couple.
 (a) ZIFT (b) IUI (c) GIFT (d) ICSI
- (ii) What is the pre-requisite of this technique?
 (a) Gamete formation should be normal. (b) Fallopian tubes should be normal.
 (c) Female should have thick endometrial lining. (d) Male should be able to copulate the female.
- (iii) **Assertion :** GIFT is an *in-vitro* fertilisation technique.
Reason : In GIFT, gametes are fertilised outside the female body.
 (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 (c) Assertion is true but reason is false.
 (d) Both assertion and reason are false.
- (iv) The procedure advised to couple involves the transfer of
 (a) fertilised ovum (b) embryo with 8 blastomeres
 (c) sperms and unfertilised ovum (d) embryo with 16 blastomeres.
- (v) What is the success rate of this procedure?
 (a) 30-50% (b) < 20% (c) 80-85% (d) 27-30%

6

Read the following and answer any four questions from 6(i) to 6(v) given below:

A technique known as amniocentesis is used to determine fetal abnormalities. This test is based on the chromosomal pattern in amniotic fluid. However this technique is legally banned now.



- (i) Identify X and Y in the above given figure.
- | X | Y |
|------------------|--------------|
| (a) Amnion | Chorion |
| (b) Uterine wall | Placenta |
| (c) Placenta | Uterine wall |
| (d) Uterine wall | Amnion |
- (ii) What is the function of Z?
- (a) Z is an amniotic fluid which prevents dessication of an embryo.
 (b) Z is yolk sac which functions as site of early blood cell formation.
 (c) Z is amnion which takes part in placenta formation.
 (d) None of these

(iii) Which of the following diseases can not be diagnosed by amniocentesis?

- (a) Down's syndrome (b) Sickle cell disease (c) Jaundice (d) Cystic fibrosis

(iv) **Assertion :** Amniocentesis is legally banned for sex determination.

Reason : Amniocentesis was being misused for aborting normal female fetus.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true but reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

(v) Which of these is a non-invasive technique of detecting fetal disorder?

- (a) Fetoscopy (b) Chorionic villi sampling
(c) Amniocentesis (d) Ultrasound imaging

7

Read the following and answer any four questions from 7(i) to 7(v) given below:

Rohan, a 13 year old school student has been diagnosed with AIDS. He often complains of fever, nausea, headache and lethargy. Doctor advised some drugs to prolong his life.

(i) What could be the most likely mode of transmission of disease to Rohan?

- (a) Artificial insemination (b) Sexual intercourse with infected partner
(c) From injected mother through placenta (d) Use of contaminated blade.

(ii) Name the drug prescribed for treatment of this disease.

- (a) Zidovudine (b) Taxol (c) Vinblastine (d) Both (a) and (c)

(iii) **Assertion :** AIDS is an incurable STD.

Reason : AIDS virus attacks helper T-lymphocytes.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true but reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

(iv) AIDS cannot be diagnosed by

- (a) ELISA (b) PCR (c) Western blotting (d) VDRL.

(v) AIDS can be transmitted by

- (a) sharing towels (b) kissing
(c) sharing contaminated needles (d) all of these.

8

Read the following and answer any four questions from 8(i) to 8(v) given below:

Medical termination of pregnancy is termination of pregnancy before the fetus become viable. To reduce the incidence of illegal abortion and consequent maternal mortality, MTP Amendment Act, 2017 was enacted by the government of India. About 40-50 million MTPs are done in a year all over the world.

(i) Abortion can be safely done for about _____ weeks of pregnancy.

- (a) 4 (b) 12 (c) 8-10 (d) 15-18

- (ii) How is MTP helpful in decreasing human population?
(a) By aborting normal female fetus (b) By increasing maternal mortality rate
(c) By getting rid of unwanted pregnancies (d) None of these
- (iii) Select an incorrect statement for MTP.
(a) Second trimester abortions are more risky than first trimester.
(b) It is being misused to abort normal female fetus.
(c) It helps to get rid of unwanted pregnancies.
(d) Child detected with congenital heart disease cannot be aborted.
- (iv) MTP was legalised by Government of India in
(a) 1971 (b) 1982 (c) 1973 (d) 1991.
- (v) **Assertion :** MTPs are safe during first trimester of pregnancy.
Reason : After first trimester, fetus become intimately associated with the maternal tissues.
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true but reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

9

Read the following and answer any four questions from 9(i) to 9(v) given below:

Oral administration of small doses of hormones is contraceptive method used by the females. They are used in the form of tablets and hence called the pills. The oral pills are two types; mini pills and combined pills.

- (i) Mini pills contain
(a) estrogen only (b) progestin only
(c) combination of progesterone-estrogen (d) inhibin.
- (ii) How do hormonal pills prevent pregnancy?
(a) By phagocytosing the sperms (b) By inhibiting ovulation
(c) By preventing sperms from entering the vagina (d) All of these
- (iii) Pill containing non-steroidal preparation, centchroman is
(a) Mala D (b) Mala N (c) i-Pill (d) Saheli.
- (iv) Which among the following is incorrect for oral contraceptives?
(a) Oral pills alter the uterine endometrium and make it unsuitable for implantation.
(b) Oral pills have to be taken daily for 7 days starting within first five days of menstrual cycle.
(c) Oral pills increase the risk of intravascular clotting.
(d) Oral pills contain either progestin alone or combination of progestogen and estrogen.
- (v) **Assertion :** Mala D, a combined contraceptive pill have to be taken daily without a break.
Reason : Mala D contains synthetic progesterone and estrogen.
(a) Both assertion and reason are true and reason is the correct explanation of assertion.
(b) Both assertion and reason are true but reason is not the correct explanation of assertion.
(c) Assertion is true but reason is false.
(d) Both assertion and reason are false.

Read the following and answer any four questions from 10(i) to 10(v) given below:

A woman unable to conceive after many years of regular unprotected coitus went to specialised infertility clinic. On complete examination, woman was found to be normal while male partner was diagnosed with infertility. Male partner is unable to copulate the female. Couple was advised to opt for assisted reproductive technology (ART).

- (i) Which ART could have been useful for this couple?
 (a) ZIFT (b) IUT (c) AI (d) GIFT
- (ii) In which of the following infertility issues could this technique be used?
 (a) Anovulation (b) Oligospermia
 (c) Low fructose content in seminal fluid (d) All of these
- (iii) Which among the following techniques is useful to conceive when there is very low sperm count?
 (a) GIFT (b) Test-tube baby (c) IUT (d) ICSI
- (iv) **Assertion :** Artificial insemination (AI) is intra-uterine insemination.
Reason : In AI, sperms collected from donor are introduced into the uterus.
 (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 (c) Assertion is true but reason is false.
 (d) Both assertion and reason are false
- (v) Success rate of artificial insemination technique is
 (a) 20-40% (b) 60-70% (c) 40-50% (d) 5-7%.

ASSERTION & REASON

For question numbers 11-25, two statements are given-one labelled Assertion and the other labelled Reason. Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below.

- (a) Both assertion and reason are true and reason is the correct explanation of assertion.
 - (b) Both assertion and reason are true but reason is not the correct explanation of assertion.
 - (c) Assertion is true but reason is false.
 - (d) Both assertion and reason are false.
11. **Assertion :** Sponge and Delfin are chemical methods of contraception.
Reason : Diaphragms and cervical caps are disposable barrier method of contraception.
 12. **Assertion :** To achieve zero population growth rate, the replacement level should be slightly higher than 2.
Reason : Replacement level means the number of children that can replace parent equally.
 13. **Assertion:** Rhythm contraceptive method can be beneficial to the couple facing fertility problem.
Reason : Rhythm method is based on the ICSI technique.
 14. **Assertion :** *Chlamydia trachomatis* is a human pathogen that causes trachoma, sexually transmitted and perinatal infection.
Reason : *Chlamydia trachomatis* has DEFGHIJK serotypes.
 15. **Assertion :** A medical termination of pregnancy is legally allowed upto the 28th week of pregnancy.
Reason : MTP is done if family physician or gynaecologist consider the need for abortion.

16. **Assertion :** PCR, ELISA, DNA hybridisation are confirmatory tests for sexually transmitted diseases.
Reason : Incidence of STDs are very high in persons above the age of 30.
17. **Assertion :** Subcutaneous implants (Norplants) involve implantation of synthetic progesterone under the skin.
Reason : Norplants block ovulation and thickens the cervical mucus to prevent sperm transport.
18. **Assertion :** Oral contraceptive pills check ovulation.
Reason : Oral pills always contains combination of progesterone and estrogen.
19. **Assertion :** All sexually transmitted diseases are completely curable if it is detected and treated properly in primary stage.
Reason : HIV infection is completely curable with drugs like Zidovudine, Didanosine and Azidothymidine.
20. **Assertion :** Enterobiasis is a sexually transmitted disease caused by pinworm.
Reason : Enterobiasis is treated with antihelminthic drugs.
21. **Assertion :** Now-a-days amniocentesis is banned.
Reason : Amniocentesis gives the information of any abnormality in the fetus and many other complications regarding pregnancy can be detected.
22. **Assertion :** Periodic abstinence is a natural method where couples abstain from coitus.
Reason : Coitus from day 5-10 should be avoided because this is the time of ovulation.
23. **Assertion :** Fetal chromosomal disorders can be diagnosed by chorionic villi sampling.
Reason : Karyotyping can be done for mitotically dividing cells of chorionic villi.
24. **Assertion :** In GIFT, fertilisation takes place *in vivo*.
Reason : The results of GIFT are less better than *in vitro* fertilisation.
25. **Assertion :** Generally, a woman does not conceive during the lactation period.
Reason : The hormone 'prolactin' initiates and maintains lactation in a postpartum woman.

HINTS & EXPLANATIONS

1. (i) (c) : A rapid decline in death rate, maternal mortality rate, infant mortality rate and an increase in number of people in reproductive age are reasons for population explosion.
(ii) (a) : Logistic growth shows S-shaped or sigmoid growth curve.
(iii) (b)
(iv) (c)
(v) (d) : Emigration is the number of individuals of the population who left the habitat.
2. (i) (c) : Rhythm method is temporary avoidance of sex in which couples avoid from intercourse from day 10-17 of menstrual cycle because ovulation can occur during this period.
(ii) (a)
(iii) (b) : Ovulation does not occur during intense lactation following parturition. Hence, lactational amenorrhea is effective for about 4-5 months after parturition.
(iv) (d)
(v) (a) : Refer to answer 2(i).
3. (i) (c) : Cu ions suppress motility and fertilising capacity of sperms.
(ii) (a) : Hormone releasing IUDs (progestasert, LNG-20) make the uterus unsuitable for implantation and the cervix hostile to the sperms.
(iii) (b)
(iv) (a) : Lippes loop is a non-medicated IUD and progestasert is a hormone releasing IUD.
(v) (b)
4. (i) (c) : Sahil is suffering from gonorrhoea, a sexually transmitted disease caused by a bacterium *Neisseria gonorrhoeae*.

(ii) (b) : Trichomoniasis, chancroid and genital warts are STDs caused by protozoa, bacteria and virus respectively.

(iii) (c) : Gonorrhoea can be cured through use of appropriate antibiotics like penicillin and ampicillin.

(iv) (a)

(v) (d) : *Treponema pallidum*, *Neisseria gonorrhoeae* and *Haemophilus ducreyi* are bacterial organisms which cause syphilis, gonorrhoea and chancroid respectively. *Trichomonas vaginalis* is an protozoan which causes trichomoniasis.

5. (i) (c) : In GIFT (Gamete Intra Fallopian Transfer), gametes (sperm and unfertilised ovum) are transferred into fallopian tubes.

(ii) (b)

(iii) (d) : GIFT is an *in-vivo* technique, in which fertilisation take place inside the body of the female.

(iv) (c) : In GIFT technique, both the sperm and unfertilised oocytes are transferred into the fallopian tubes.

(v) (d)

6. (i) (b)

(ii) (a)

(iii) (c) : Amniocentesis is a fetal disorder test based on the chromosomal pattern in the amniotic fluid surrounding the developing embryo. It detects genetic disorders like Down syndrome, sickle cell anaemia and cystic fibrosis.

(iv) (a)

(v) (d) : Non invasive techniques are available to determine the fetal condition. These techniques do not pose any risk to fetus. Ultrasound imaging is a non-invasive technique.

7. (i) (d)

(ii) (a) : There is no cure of AIDS, however use of certain drugs can prolong the life of AIDS patients. E.g., Zidovudine, Didanosine.

(iii) (b)

(iv) (d) : AIDS can be diagnosed by ELISA test and western blotting test. Western blotting test is used for confirmation of ELISA positive cases. PCR is also used to diagnose AIDS. VDRL (Venereal Disease Research Laboratory) is not used to detect AIDS.

(v) (c) : Virus of AIDS is transmitted *via* blood and semen.

8. (i) (b) : MTP is comparatively 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.

(ii) (c) : MTP helps to get rid of unwanted pregnancies due to casual unprotected intercourse, or where pregnancy can be harmful to either mother or fetus.

(iii) (d) : Child detected with congenital heart disease can be aborted upto 28th week of pregnancy under the guidance of family physician and the gynaecologist.

(iv) (a) : Government of India legalised MTP in 1971 with some strict conditions to avoid its misuse.

(v) (a) : Refer to answer 8(i).

9. (i) (b) : Mini pills contain progestin only with no estrogen.

(ii) (b) : Oral contraceptive pills inhibit ovulation and implantation.

(iii) (d) : Saheli contains non-steroidal preparation called centchroman.

(iv) (b) : Oral pills have to be taken daily for 21 days starting within first five days of menstrual cycle.

(v) (b)

10. (i) (c) : Artificial Insemination (AI) is done in infertility cases either due to inability of male partner to copulate the female or due to very low sperm count in the semen of male partner.

(ii) (b) : Oligospermia is very low sperm count.

(iii) (d) : ICSI is intra cytoplasmic sperm injection.

(iv) (a)

(v) (a)

11. (c) : Diaphragms, cervical caps and vaults are made of rubber, inserted into the female reproductive tract to cover the cervix before coitus. They prevent fertilisation by blocking the entry of sperms through the cervix. These barriers are reusable.

12. (a)

13. (d) : Rhythm method is a natural method of birth control in which the couples avoid or abstain from coitus (intercourse) from the day 10 to 17 of the menstrual cycle as ovulation occurs during this period. It is also known as periodic abstinence.

14. (b)

15. (b)

16. (c) : STDs are a major threat to healthy society. Incidence of STDs is very high in persons who have 15-24 years of age.

17. (b)

18. (c): Oral pills contain either progestin (progesterone) alone or a combination of progestogen and estrogen.

19. (d): HIV infection, hepatitis-B and genital herpes are incurable STDs. HIV infection causes AIDS. Although there is no cure of AIDS, yet use of certain drugs like Zidovudine, Azidothymidine and Didanosine can prolong the life of AIDS patient.

20. (b)

21. (b): Amniocentesis is a fetal sex determination and disorder test based on the chromosomal pattern in the amniotic fluid surrounding the developing embryo. It is withdrawal of a sample of the amniotic fluid surrounding the embryo in the uterus by piercing the amniotic sac through the abdominal wall. Amniotic fluid drawn from the uterus contains cells from the embryo (mostly shed from the skin). Cell cultures enable chromosome patterns to be studied so that prenatal diagnosis of chromosomal abnormalities (such as Down's syndrome) can be made. Metabolic errors and other diseases such as spina bifida, can also be diagnosed prenatally from the biochemistry of the cells. Now-a days, instead of positive uses of amniocentesis, it is being used for female feticide. Sex of the fetus is determined using amniocentesis and then if it turns out to be a female one, fetus is aborted. That is why amniocentesis has been banned in India.

22. (c): Periodic abstinence is a natural method of birth control in which the couples avoid or abstain

from coitus (copulation or intercourse) from day 10 to 17 of the menstrual cycle because ovulation can occur during this period. The chances of fertilisation are very high during this period, therefore, it is called the fertile period.

23. (a): During early pregnancy, fetal chromosomal disorders can be diagnosed using chorionic villi sampling. In this technique the physician inserts a narrow, flexible tube through the mother's vagina and cervix into the uterus (guided by ultrasound) and withdraws a small amount of fetal tissue (chorionic villi) from the placenta. Because the cells of the chorionic villi are undergoing rapid mitosis, these cells can be used for karyotyping.

24. (c): GIFT is a more expensive and invasive procedure than IVF (*in vitro* fertilisation) but its results are better than IVF.

25. (b): Milk secretion is maintained as long as breast feeding, and hence hormone production continues. A woman does not conceive during the lactation period because lactation stimulates prolactin secretion and there is evidence that prolactin inhibits GnRH secretion, and antagonises the action of gonadotrophins on the ovaries. Ovulation is inhibited, and the ovaries are inactive, so estrogen and progesterone output falls to low levels. Thus during lactation a woman does not conceive. Only 5–10% chances are there during lactation period. This can also be interpreted as mechanism devised by nature so that mother can look after the new born child by providing it with milk.