

Female Reproductive System and Functioning

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Introduction

As you have already read in the earlier chapter, adolescence is a period of transition from childhood to adulthood. These are formative years when the maximum amount of physical, psychological and behavioural changes take place. These years are also a time of preparation for undertaking greater responsibilities, a time of exploration and widening horizons, and a time to ensure healthy all round development.

In the earlier chapter, we discussed the formative years of the human male and later, also the anatomy and functioning of the male reproductive system. In this unit, we will discuss the female adolescent, the physiological changes, accompanied by the psychological and behavioural changes that take place in her. Later in the chapter, we will also discuss the various aspects of the female reproductive system and its functioning.

Changes at the Onset of Adolescence

Adolescence is often described as a phase of life that begins in biology and ends in society. The change is evident in the physical as well as psychological and social development. You have already read in the earlier unit that a sure sign of reaching adolescence is the onset of rapid physical changes in the body. These changes are experienced not simply as increase in size, but also as addition of physical characteristics and

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sensations. We have already said that when rapid changes in body size and proportions take place, physical changes in the reproductive system also occur leading to sexual maturity. By now you know that the internal and external body parts that are necessary for reproduction are collectively referred to as the Reproductive System. Although many of the reproductive organs are present in children from the very beginning, these are very small in size and inactive until the time of puberty.

As we have already discussed in the earlier chapter, sexual maturation consists of two types of changes in the reproductive system, the primary and the secondary. Those that relate to the primary sex organs such as the penis and testes in males, and the vagina and the ovaries in females are called primary sex characteristics; whereas associated changes visible on the body are referred to as secondary sex characteristics. These include breast development in females, facial hair or beard in males, and growth of under-arm and pubic hair in both sexes.

Among girls, the first sign of puberty is usually the appearance of a small rise around the nipple called the breast bud. Breast development begins before adolescence, sometimes between nine and eleven years. Prior to the bud-stage during pre adolescence, the papillae (or nipples) have already become elevated. In the bud stage, the dark area around the nipple, called the areola, enlarges and the papillae become raised. The remaining stages in breast development that occur up to the end of adolescence are: the enlargement continues and the papillae and areola form a secondary mound; the areola recedes and there is shaping of the breast; and finally the papillae project out.

The appearance of pubic hair takes place soon after the breast bud stage in most girls, although in some girls it may appear first. Growth of the uterus and the vagina

occurs along with breast development. Growth in the other parts of the female genital organs, i.e. labia and the clitoris also take place. The ovaries become enlarged and the cells that eventually mature into ova (egg) begin to ripen.

The most dramatic and perhaps the most important to the girl is the event of the first menstrual period. The first menstruation is called menarche. It consists of a flow of sticky blood in small amounts from the vagina. Menarche is one of the later signs of puberty in girls and occurs about 18 months after the growth spurt reaches its peak. Among Indian girls menarche is reached sometimes between 11 and 15 years, the average being 13 years. The early menstrual periods might be slightly irregular i.e they may not occur at the same time interval every month. It is normal to have early or delayed menstrual period for about two years. While menarche does signify that the female reproduction system, including the ovaries, the uterus and the fallopian tubes have reached maturity, these are not yet ready for the full reproductive function, i.e. to bear a child.

The remaining secondary sex characteristics in girls appear after the menarche. Growth of pubic hair and breast development are completed while axillary hair appears. These changes may take a fair amount of time. Some may complete the process in one-and-a half to two years while others may take up to five years. However, any duration within this range is normal.

As you are perhaps familiar, every child is born with the genes received from the parents that are responsible for her or his resemblance to them and their ancestors. Following the same rule, the girl's age of menarche is likely to be similar to the mother's menarcheal age, provided there have not been any major changes in the girl's health status. Further, it has been found that in different parts of the world, girls attain menarche at

different ages, especially when they belong to different racial groups. Indian girls from different backgrounds are found to have a slightly lower age at menarche (12.5 years), compared to those of European and American origin (12.8 years).

Nutrition is an important factor in health. If the nutrients required by the body at a particular stage are not present in the diet, it can affect many aspects of health, including advancing the age of menarche in girls. The energy requirements of a girl approaching womanhood are much greater than those during childhood. You should know that the average Indian middle-class girl has been found to consume inadequate amount of nutrients. For this reason, the age of menarche among rural and urban poor girls, is later than that of urban affluent girls, presumably with better nutritional status.

We will now study in detail the female reproductive system. We will also learn about menstruation, pregnancy and other significant aspects related to them. The female reproductive system consists of the external genital (vulva) and an internal group of organs.

The External Organs

The external genitalia of the female are known as vulva, which means “covering” or the pudendum, meaning “a thing of shame”. The vulva is the area between the thighs behind a hairy part which is in front (mons pubis). The mons pubis (also called Mount of Venus, the Greek Goddess of love) consists of a pad of fatty tissue covering the pubic bone. The mons pubis is covered with pubic hair which appears at the time of puberty. The pubic hair is stiff, coarse and curly. The thickness and curliness of the hair depends not only on the hormones but also on racial and genetic factors. The area covered with pubic hair in a female looks like an inverted triangle, the upper line being straight. In some girls the hair might extend up to the navel and creep around and

inside of the thighs. In some, the pubic hair may be very thin and sparse. Both types are perfectly normal. The vulva include the clitoris, labia majora, labia minora and the urethra.

The Clitoris

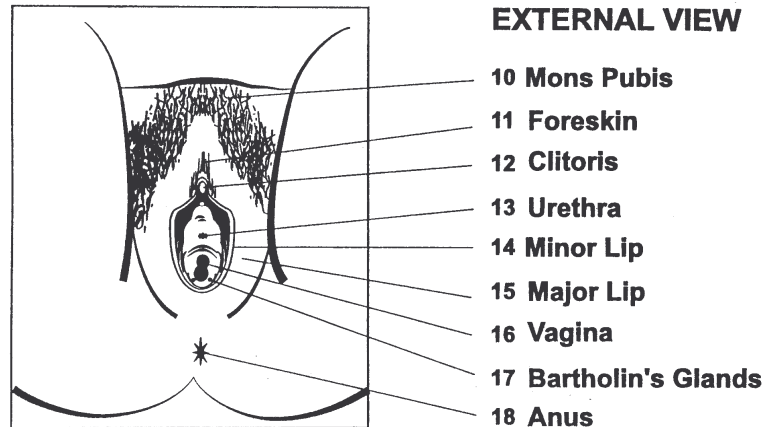
The clitoris is small cylindrical organ resembling the penis but with a hook shape. It is about the size of a pea that is located in the soft folds of the labia that meet just above the opening of the urethra. The clitoris contains many nerve endings and is therefore, highly sensitive. The clitoris swells during sexual excitement and becomes source of sexual pleasure when stimulated. The woman's clitoris and the glans of a man's penis are equivalent external sex organs. The clitoris has hardly any reproductive function. Its main purpose is attainment of sexual pleasure. However, clitoris is usually stimulated by midwives during childbirth in order to enable the expansion of the vagina for the smooth passage of the baby. Thus it has great importance for most of the women in India who are assisted by midwives for childbirth in their homes. Like penis it consists of spongy, erectile tissue. Even though the clitoris swells during sexual excitement, it does not become erect, because its overhanging prepuce, the upper layer of the labia minora, holds it down. The clitoris is an area more sensitive than any other part of the body, even more than the vagina itself.

In some societies, the practice of female circumcision or what is called 'clitoridectomy' is still prevalent. You should know that it is a mutilating procedure whereby the clitoris is amputated. We cannot provide any justification for such a crude practice. In other words, in some male dominated societies women are still viewed as mere objects of pleasure, consequently men fail to see them as equal partners in their lives.

With the removal of the clitoris, the woman loses her sexual pleasures. It is believed that clitoridectomy will

prevent women from becoming promiscuous and would remain loyal to their husbands. We need to educate people against such painful and wrong ideas which are nothing but misconceptions.

Female Reproductive System : External View



The Labia Majora

The most visible part of the female genitalia is the slight protuberance known as the mons pubis or mons veneris (Mount of Venus), which gets covered with the pubic hair following puberty. The major lips or labia majora that curve downward between the thighs vary in prominence. The labia-majora or out-lips, are two folds of skin located at the outermost on either side of the vagina. They protect the clitoris, and the urethra and vaginal openings.

The Labia Minora and Urethra

The inner edges and surrounding areas are hairless. Along the inner edges of the labia majora are two-folds of tissue called the inner or minor lips or the labia minora. The colour varies from light pink to brownish black and the texture from fairly smooth to wrinkled. At the upper end, the labia minora join to form a fold of skin called the prepuce (or foreskin) that encloses the clitoris. The labia minora and the clitoris have a rich

blood supply, and an extensive network of sensory fibres and elastic tissue. The structures lying in between the labia minora from above downwards are: the clitoris, the urethra and the vaginal opening. The urethra, as you might be knowing is not a part of the female reproductive system. Its sole function is to pass urine from the bladder. You have already read in the previous unit that the urethra in male is a passage for both urine and semen.

The Skene's and Bartholin's Gland

The Skene's and Bartholin's glands are located in the labia minora. The Skene's glands are one each side of the opening to the urethra. The Bartholin's glands are on each side of the opening to the vagina, at the lower one third of the labia majora. The Bartholin's glands consist of two small round bodies, which are the counterpart of the Cowper's glands in the male. Each gland opens by means of a duct at the side of the hymen. It secretes sticky mucus during sexual stimulation, which lubricates the entrance to the vagina and its surrounding parts in preparation for coitus. These glands secrete freely only under sexual excitement. Occasionally, one of these glands can fill with mucus and form a painless swelling known as a Bartholin's cyst. At times the gland may become infected and form a painful abscess.

The Internal Organs

Situated deep within the female body are the organs for sexual development as well as for the reproduction of life. To protect these organs against possible accident or injury, they are housed in a strong, basin-like bone structure called the pelvis. The hip bones are the outer boundaries of the pelvis, while the backbone at the rear and strong muscles at front provide complete protection. The internal organs broadly consist of the vagina, uterus, fallopian tubes and ovaries.

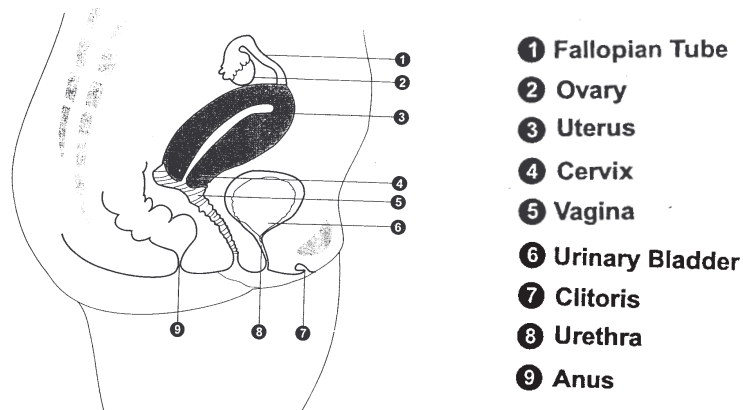
The Hymen

The outer opening of the vagina is partially closed by a thin fold of fibrous tissue called the hymen, or, as it is often termed the 'maidenhead'. The size and shape of the hymen varies. It forms a seive like cover for the vaginal opening. Normally, it is centrally perforated, in order to allow the flow of the menstrual fluid. Some women are also born without this membrane. Often, this membrane is known to break during the first intercourse and this is accompanied by slight bleeding and pain. This is known as 'defloration'. But, it is important for you to know that sometimes before defloration takes place, the hymen may get torn as a result of physical exercise or because of frequent use of tampons during menstruation or due to physical injury. Therefore, the absence of the hymen does not necessarily mean that the girl has had sexual intercourse.

Imperforate Hymen

In some girls, a condition known as 'imperforate hymen' is detected once they reach puberty. This means that the hymen has no opening for the menstrual fluid to flow out.

The Female Reproductive System



Although this is a very rare phenomenon, surgical help should be sought to avoid further complication. The early symptoms are the swelling of vagina and the uterus as a result of the accumulated menstrual fluid, which has no outlet. In a few cases, some women may have a thicker or tougher hymen than the average or normal hymen. This is likely to cause much discomfort and pain during the first intercourse. Such cases, however, are very rare and might need surgical help. The surgical correction does not require one to have bed-rest or medication. It is only a simple procedure lasting a couple of minutes.

As we said earlier, the opening in the middle of the hymen will permit the passage of a sanitary tampon. In most cases, this passage cannot accommodate an erect penis without tearing it. Since some hymens can withstand intercourse, while other get torn accidentally in nonsexual activities like certain kinds of exercise, bicycle or horseback riding or while squatting on the ground, the presence or absence of an intact hymen does not constitute a reliable criterion of whether or not a girl has had an intercourse. Very often, the girl is not even aware that anything has occurred when her hymen breaks during a fall or while taking part in activities like sports.

In many cultures, people believe that a girl without a hymen is no longer a 'virgin'— that a boy perhaps has put his penis in her vagina. But that may not always be true. Virginity has nothing to do with whether or not the hymen is present. There is no way for anyone to tell whether the hymen was broken in intercourse or in an accident.

The Vagina

The vagina is a muscular tube or passage way that connects the neck of the uterus and the external opening at the vulva. It is about four to five inches long. The inner wall of the vagina is lined by a membrane

which has large folds giving it a wrinkled appearance. The inner wall of the vagina is moist due to certain secretions which are acidic and serve a protective purpose against germs causing diseases. At the time of sexual excitement this fluid is slightly increased, serving the purpose of lubrication, that makes it easy for the penis to enter the vagina.

Vaginal Discharge

This moisture consists mainly of mucus from the cervix and a watery fluid which comes from the vagina walls; it is scanty and is not sufficient to mark the underclothes. When woman experiences persistent increase in quality of vaginal secretion, we call it leucorrhoea which can occur in a number of diseases. It is often offensive in smell and has a different colour from the normal liquid, usually staining the underclothes. At times a foreign body may be the cause, at other times, taking contraceptive pills for a long time, antibiotics, or a fungus called monillia is commonly responsible. The vaginal discharge in these cases is thick, curdy white, causing inflammation of the vagina and vulva.

Other causes of discharge include a common infection of the vagina with a germ called Trichomonas. This germ is transmitted between the partners during sexual intercourse and it may cause itching and swelling of the vulva, inflammation of the vagina and pain during intercourse. This infection is easily curable and both the woman and the man should be treated.

Misinformation

The front and rear walls of the vagina are normally in contact. This permits distension and has the effect of allowing the passage to adapt to a penis of any shape and size. It is never too narrow for intercourse. There is misinformation about the length and width of vagina both among men and women. Some men observe that some vaginas 'feel tight' and others 'feel lax'. Similarly,

some women support the observation that the 'fit' during intercourse varies from one person to another.

The vagina is sensitive only in its out 3-4 cms. The inner walls have only a few nerve endings sensitive to touch, and this makes the vagina relatively insensitive so that even local operations can be carried on without pain.

Uses of Vagina

Thus as you may have observed, the vagina has essentially three uses: i) It provides a way for the baby to leave the uterus. Hence, the vagina is also called the 'birth canal'. ii) It receives the man's penis during sexual intercourse. That is how the sperm get inside the uterus. iii) It provides a path for menstrual fluid to leave the body. However, you must know that urine does not pass through the vagina.

The Uterus

The uterus, which is commonly known as the womb, is the child-bearing organ. It is a pear-shaped muscular organ that lies between the urinary bladder in front and the rectum behind. It is about 8 cms in length and 5 cms in breadth at the upper end and 1 inch at the lower end. The upper part of the uterus is connected to the tubes and called the body of the uterus. The portion of the body above the tubal attachment is called the fundus, while the lower portion is known as the cervix and it projects into the vagina.

The interior of the uterus is a narrow, triangle shaped cavity. This cavity is lined with a special membrane called the endometrium, and is surrounded by thick muscular walls. This narrow cavity undergoes extensive changes in pregnancy and during the menstrual cycle. The endometrium thickens under the stimulus of the two sex hormones in preparation of pregnancy. During pregnancy the embryo and the foetus develop in the

uterus which sits down deep in the lower abdomen. The muscles of the uterus contract during labour to deliver the foetus from the uterus. The uterus is the strongest muscle in the woman's body. You should note that it is so strong, that it is able to push the baby out at childbirth.

Inside the muscular walls of the uterus is a very rich lining. This lining feeds the growing foetus during pregnancy. However, if fertilization does not take place by the joining of the ovum and the sperm, that is if the woman does not become pregnant, then the thickened lining of the womb to produce discharge of blood. This blood and lining pass down through the vagina to the outside of the body, at the vulva. This process is known as menstruation or monthly period about which you will read in further detail later in this unit.

The Greek word for uterus is 'hystera'. The surgical removal of the uterus is medically termed as hysterectomy. Originally, the psychologically common word 'hysteria' was associated with the uterus. The wandering of the uterus in search for a child was termed as 'hysteria' by the Greek physicians.

The uterus remains very small until the age of puberty. It is about the size of one's fist. It starts growing along with other reproductive organs and reaches maturity when the girl is about 18-20 years old. When the woman is not pregnant, as you have already read, the inside walls of the uterus touch each other. When she is pregnant, they spread apart to make room for the foetus. The pregnant uterus can become as large as a medium-sized Watermelon. As mentioned earlier, a man's body constantly produces sperm while a woman's body produces only one ovum at a time in a month. But, when the woman is pregnant, the ovaries stop producing ova. This means that a mother-to-be stops having periods during the nine months it takes her baby to be properly formed within her, until it is born.

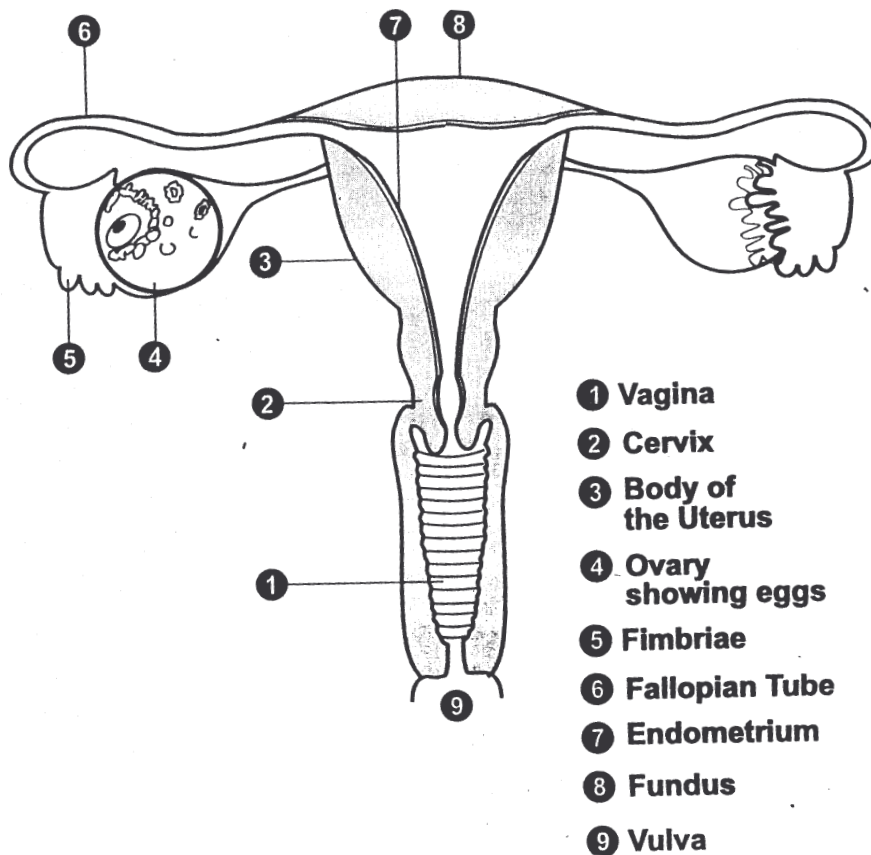
The Ovaries

The ovaries are two female sex glands, the counterpart of the testes in the male. These glands are small and almond-shaped located on each side of the uterus and are attached by ligament. Each of them is about 3-5 cms long, 2-5 cms wide and one cm thick. The ovaries are the most important organs of the entire female reproductive apparatus, and correspond in function of the male testicles. You should know that it has the dual function of production of germ cells and sex hormones. The ovaries are smaller than the testes and remain within the abdominal cavity of the foetus.

The ovaries produce ova which are the female reproductive cells. In the male, sperm production starts at the age of puberty and continues till old age, where in the female, even at birth, the ovaries contain a fixed number of eggs or ova (200,000 to 400,000). As girl grows, some of these eggs die, so that the number of eggs the ovaries contain are about 10,000 immature ova. Each egg is enclosed in a separate sac called the primordial follicle.

During the fertile period of a woman (average from 13-14 to 45-50 years of age) for every ovum that completely matures, untold number of immature ova are lost the attempt and become mere microscopic specs of scar tissue embedded in the substance of the ovary. During the fertile period, less than 500 of these eggs ripen and are released into the fallopian tubes. The egg is laden with nourishment to sustain a growing pre embryo in its first few days. The egg is the largest human cell. You should note that mostly, the cells of the human body measure only 1/10 of the egg which in turn has a diameter of 1/5 mm. It is about the size of a dot of a newsprint. The shape of the egg is spherical, like a ball, and inside it there is its nucleus which contains the female chromosome. The egg is released from one ovary during ovulation beginning at puberty. The ovaries

also produce female sex hormones---estrogen and progesterone as well as small amounts of testosterone.



The development of the primordial follicle (the sac which encloses an egg) into a mature follicle (also called the Graafian follicle) is under the control of the pituitary gland located at the base of the brain, which secretes the follicle stimulating hormone.

The ripening follicle secretes estrogen, in increasing amounts, which reaches its maximum just before ovulation. At this moment, the chosen mature follicle bulges on the surface of the ovary like a small blister. When pituitary releases a second hormone, called the

Luteinising Hormone, it causes the follicle to break and release the ovum. The event is called ovulation. The released ovum is drawn into the fallopian tube by the finger like ends of the tube itself. This released ovum has a life span of 12-24 hours, and this is the most fertile period of woman's cycle. The mature of follicle, after the release of the egg, becomes a small yellow body (called the corpus luteum), which secretes two hormones: estrogen and progesterone. The presence of these two hormones in the blood signals the pituitary to stop its activity. At the end of the cycle, as corpus luteum fades, the level of estrogen progesterone drops and the pituitary again begins to stimulate the ovaries and the whole process is repeated in a new cycle.

Between 45 and 50 years of age, the ovaries gradually stop responding to the stimulation of the pituitary gland, with the result that the eggs and the hormones of the ovary are not produced. Ovulation occurs with decreasing frequency, the cycles become more and more irregular and after some time menstruations stop completely. The period when the reproductive processes are coming to a halt is called premenopause. Once menstruation has completely stopped for a full year, the woman is said to have reached menopause.

The Fallopian Tubes

Gabriello Fallopio was an anatomist of the sixteenth century who thought that the two tubes found on each side of the uterus are 'ventilators' of the uterus. The Fallopian tubes are named after him. The fallopian tubes are a pair of muscular hollow channels, about 8-10 cms long, which extend from the top of each side of the uterus to the ovaries. The ovarian ends of these tubes are entirely free as they do not touch the ovaries. The outer edge of each of the tubes, as discussed earlier, cap the ovaries with finger like ends or fringes. These are known as the fimbriae. The function of the fimbriae is to sweep a mature egg from the ovary into the tube. Each tube is lined with a membrane which possesses

tiny hair like structures called cilia. These cilia move in such a way so as to push the egg towards the uterus, when contractions take place in the tubes. The egg can live in the fallopian tube for about 24 hours. However, the life of a sperm in the woman's body is about four days. After that the sperm dies.

Whenever fertilization of the egg takes place it occurs at the junction of the middle of one third of the tube. Once the egg and sperm unite in the process of fertilization, it is known as zygote. Sometimes, the zygote gets implanted in the wall of the fallopian tube. That means the fertilized zygote could not reach the uterus; this is called an 'ectopic pregnancy', or out of place pregnancy. It is very dangerous for the pregnant woman. Such pregnancies cannot come to full term of nine months and break the tube. This causes the death of the foetus. Therefore, it is advisable for every pregnant woman to seek the help of a qualified physician and regularly go for check up. An ultra-sound examination can satisfactorily tell us all about the position and growth of the foetus in the womb. Therefore, if it is detected that a woman is having a tubal pregnancy, prompt medical intervention can save the woman from further complications.

It is important for you to note that tubectomy or the sterilization of woman is done by cutting the fallopian tubes. This is much more complicated procedure than vasectomy, in which surgery is done on the vas deferens of the male to sterilize him.

The Breasts

The breasts are another pair of reproductive organ in the female. The breasts contain milk glands that produce milk and the milk ducts that carry the milk to the nipple so that the infant is able to have its feed. These milk glands and milk ducts are surrounded and protected by fatty tissue. The fact that a female has breasts does not mean they produce milk. The production

of milk starts only after childbirth. When a woman is pregnant, her body begins to produce the pregnancy hormones. These hormones help the breast to grow and get ready to make milk. It also helps every part of the woman's body to adapt to being pregnant.

There is no specific size and shape for breasts. Some women have large breasts while others have small one. In certain cases, some women may have one larger breast and a smaller breast. The size and shape of the breasts have no effect on the ability to feed a baby. On the outside of the breast is nipple, through which the baby can suck the milk. It is surrounded by a circle of dark coloured skin. It is called the areola. Normally, pregnant women experience milk discomfort or pain when pressed upon around their breasts. This is only a positive sign of pregnancy.

Nevertheless, one common disease prevalent among women is breast cancer. It is most common in women about thirty-five years of age, though, it can also affect younger women. Since one in ten women are reported to be suffering from breast cancer, it is suggested that women should regularly check their breasts for lumps. A gynecologist can give you information about how to check the breasts. This, though, is not required before the girl has had her first period.

Menstrual Cycle and the Onset of Puberty

During puberty, under the influence of estrogen, the pre-pubescent girl gradually turns into a woman, the contours of her body change, her breasts enlarge, and her genital organs develop more fully. Gradually, after some erratic starts and stops, she also starts to menstruate, and there appears a monthly 'bleeding' from the vagina. This usually starts at the age of 12-13 years. However, she becomes fully fertile and sexually a mature woman several years after the onset of these changes.

Menstruation is the flow of blood, fluid and tissue out of the uterus through the vagina. It may last between three to seven days. The menstrual cycle is the time from the beginning of one period to the beginning of the next one. Usually, menstrual cycles last about 28 days. However, some may last for about 20 days or so, whereas, in some cases they may extend to 35 or 40 days. In exceptional cases, they may still last longer even for a couple of months. These variations may be caused by sickness, nervous tension, emotional upset, physical injury, traveling fatigue, change in climate or other circumstances.

When pregnancy begins, menstrual cycles and ovulation stop. Progesterone and estrogen continue to be produced by the uterine lining while the embryo grows into a foetus. The presence of progesterone also stops the ovulation process for the duration of the pregnancy. Once the woman is no longer pregnant or fully nursing, the normal pattern of the menstrual cycle is resumed. After childbirth, usually the menstrual cycle resumes only after about 100 days. However, in some women, it may resume only after six months. There is misconception that a subsequent pregnancy may not occur as long as a woman continues to breast-feed her child. This is not true. Pregnancy can occur even while one is breast-feeding child.

It is important for you to understand that menstruation is a normal part of a female's life. Therefore, it should not be regarded as a sickness. In fact, if menstruation does not take place within the teenage period of a girls' life, she should consult the family doctor for necessary guidance and advice. Many superstitions and fear were associated to it before medical science brought to us the knowledge about this phenomenon and its association with the female reproductive system.

Some girls and women may have cramps on the first day or two of their periods. Some may have mood swings

or depression. They may become uncomfortable before each of their period begin. They may have physical or emotional discomfort upto two weeks before menstruating. This is called premenstrual syndrome (PMS). It happens in fewer than half of all women between the ages of 14 and 50.

It is important for mother to take special care to instruct their daughters about this important phenomenon in the reproductive system of the female. Their failure often causes the girls to develop an attitude of shame and secrecy. Some mothers hesitate talking about these matters to their daughters. As a result, the children also feel puzzled and frightened by their experience at the first menstruation, especially when it occurs at a time when they are not prepared for it. However, in some societies parents eagerly await the first menstruation of their daughter in order to celebrate it.

During the period of menstruation, there is no need for a women to restrain from her normal activities. On the whole, however, it is advisable to avoid strenuous activities. There are also certain myths surrounding menstruation, that it is a 'curse' and therefore, several restrictions are imposed upon women during this period (which are being strictly observed in many Indian families). With the break up of the joint family system though, there are changes taking place in this area.

The first time menstruation happens, it is called 'menarche'. Many families celebrate 'menarche' as the time when a girl becomes a woman. You may call them 'puberty rites'. Some families are more private about menarche. But, regardless of the celebration, it is an exciting and important moment in a girl's life.

In many cases, menstruation is accompanied by feelings of fatigue, weakness, headache, changing moods, irritable temper, and cramps in the lower abdomen. If a girl/women suffers from serious cramps or any other cyclic disturbance, a girl/women should consult her

doctor. Excessive menstrual bleeding is always a serious matter, requiring medical care, and may be dangerous because of the repeated loss of blood. In some young girls, during the initial years of menstruation, several months may elapse between periods. This is not a cause of worry. Gradually, the normal cycle is resumed.

The Females Sex Hormones

Hormones are chemicals in one's body which are secreted into the blood stream by the endocrine glands. The term 'hormone' has its origin in the early years of this century. Etymologically, hormone got its name from the Greek work for 'excite'. So far, over twenty hormones have been discovered, and many of these have some bearing on the sexual development and function. Hormones that play a central role in this regard are known as the sex hormones. Those that occur in higher concentration in the male are known as the male sex hormones (androgens), and those that are more abundantly produced in the female are the female sex hormones (estrogens and progesterone). The female sex hormones are produced in the ovaries. The ovaries start producing these female sex hormones during puberty. They play a very important role in the female reproductive life and have far reaching effects on the body of the woman.

Pregnancy and Health Care

Now that you are familiar with the male and female reproductive apparatus, you will be able to appreciate the wonderfully ingenious way nature has adapted both systems for the one purpose they were originally intended to bring together the male and female cells. If sexual intercourse takes place in the period of ovulation, the consequence may be the fertilization of the egg and hence, pregnancy.

Fertilization

During intercourse, about 200-300 millions of sperms are ejaculated in the vagina. The sperms move at a speed of 10-12 cms per hour, propelled by the movement, of their tails. The survival and transport of sperms are greatly helped by the alkaline and watery mucus secreted by the cervix, present before and during ovulation.

When one sperm touches the egg, the former secretes a substance that facilitates the penetration of the head of the sperm through a hole formed in the wall of the ovum. At this time, the tail of the sperm drops off.

At the same point of time, the outer membrane of the egg hardens, preventing the other sperms from entering. The nucleus of the sperm unites with that of the ovum to form a single nucleus. This entire process is called fertilization, and the ovum is now called a zygote (yoked together).

Growth of the Child During Pregnancy

As the zygote is pushed slowly towards the uterus, rapid changes take place. It first divides into two cells, which remain attached to each other; then into four cells and so on. After five days, it reaches the uterus and resembles a fruit with many seeds. It is called the 'morula'. By the tenth day after fertilization, the zygote measures about 2 mm in diameter.

For pregnancy to continue, a continued production of nutritive substances in the mother is achieved through a hormone which is secreted by the chorionic villi after implantation. This hormone is called the Human Chorionic Gonadotrophin (HCG), and it stimulates the corpus luteum in the ovary to increase its size and produce progesterone and estrogen. The hormones produced by the corpus luteum are important to the continuation of pregnancy only during the first twelve

weeks. After that, the production of hormones is increasingly taken over by the placenta, which produces HCG, estrogen and progesterone.

The HCG is found in the urine of woman in significant quantity 14 days after the first missed period and reaches a peak between the 70th and 100th day after ovulation. Therefore, one's pregnancy test can be confirmed by testing the urine at the end of the second week after first day of the missed menstruation.

From the moment of fertilization till the second week the growing cell mass is called a zygote. From the second to the eighth week it is referred to as an embryo, and from the eighth week till birth it is called foetus. The first twelve weeks of pregnancy are the most important and vulnerable, because all the vital organs, the heart and brain are being formed. Due precautions should be taken during this period to avoid X-rays, certain drugs and exposure to viruses.

Every living organism requires nourishment for its growth and needs to get rid of its waste products. For the foetus, the placenta serves these needs. The placenta is an oval organ about eight inches in diameter when fully developed, and is attached to the endometrium. It prevents the blood of the mother from entering into the circulation of the foetus, while allowing the passage of oxygen and nourishing elements, and simultaneously helping to excrete the waste products of the foetus. The foetus is connected to the placenta by the umbilical cord which contains blood attached to the navel of the baby. The placenta, in turn, is attached to the inner-lining of the cavity of the uterus, and is, therefore, in direct contact with the blood of the mother, which is the source of nutrition to the foetus.

It is advisable for the woman that for all the time during her pregnancy she should undergo regular check ups in order to make sure that the new life within her is developing in a healthy manner. Also, between 16 to 36

weeks of pregnancy, the vaccine, tetanus toxoid should be administered to her. Therefore, it is advisable to consult a qualified physician while one is pregnant.

Delivery

Two hundred and sixty six days after fertilization the foetus is completely developed. The word 'delivery' refers to the birth of the baby. However, the whole process can be described in three stages. The first stage is the uterine contractions (or labour pain, as you can call it), which are rhythmic contractions of the uterus. They are painful to the mother and occur at intervals of 10-15 minutes, each wave of pain lasting for about 30 seconds. With these contractions, the foetus is forced downwards. The stage usually lasts about 12-18 hours for the first child and about 8 hours for subsequent babies.

The second stage begins when the cervix is fully dilated and ends with the delivery of the baby. With each uterine contraction, the head of the child is pushed downwards. Then, one shoulder appears followed by the other, and soon the rest of the body is delivered. With the change in temperature, the child is stimulated to cry. A few seconds after the umbilical cord has been cut, air flows into the child's lungs for the first time in order to oxygenate the blood. This stage lasts for about an hour in the first delivery and 10 to 30 minutes in the subsequent deliveries.

In the third stage, following the birth of the child, the placenta is expelled. This stage may last from 10 to 30 minutes. After the birth of the child, the uterus shrinks in size and so does the area where the placenta is detached from the uterine wall. With this stage, the whole process of delivery is completed.

Physical and Emotional Care of the Child in the Womb

At no other time during the life span are there more serious hazards to development or of a more serious

nature than during the relatively short period before birth. These may be physical or psychological. Therefore, you should note that appropriate physical and emotional care of the child in the womb is of utmost importance.

Care Regarding Physical Factors

Certain conditions have been found to influence the foetus physically in more ways than one.

Maternal nutrition plays a vital role in the normal development, especially the development of the foetal brain. Excessive smoking and drinking are detrimental to normal development, specially during the periods of the embryo and foetus. Also, maternal age has often been reported as a condition that may lead to the possibility of physical hazard during prenatal period.

Certain kinds of work are more likely to disturb the prenatal development than others. Chemicals and other hazards faced by women working in places like hospitals, beauty parlours and factories may be responsible for the increasing number of birth defects and miscarriages. As Burnham (1976) pointed out, "The potential damage to the foetus and the possible genetic damage which may occur when pregnant women go to work appears to be an important medical problem".

Care Regarding Psychological Factors

Like the physical factors associated with the prenatal period, the psychological factors can have persistent effects on the individual's development. During the early formative years, there are three important psychological hazards to the unborn child's well being. These are traditional beliefs about prenatal development, maternal stress during prenatal period, and unfavourable attitudes towards the unborn child on the part of people who will play significant roles in the child's life.

There are also traditional beliefs about the causes of developmental irregularities which often hold the

mother responsible. Acceptance of these lead to feelings of guilt on the part of the mother, resentments towards her on the part of the father (husband), and tendency for the mother to overprotect the child as a form of compensation for the harm she believes she has caused.

Another important psychological factor, maternal stress, can be the result of fear, anger, grief, jealousy or envy. Causes of maternal stress during pregnancy include not wanting a child because of marital or economic difficulties or because having a child will interfere with educational or vocational plans' feelings of inadequacy for the parental role; and fears that the child will be physically deformed or mentally deficient. Maternal stress affects the developing child both before and after birth. Before birth, severe and persistent glandular imbalance due to stress may result in irregularities in the developing child and complications of delivery or even prematurity. Maternal anxiety affects uterine contractions, with the result that the labour lasts longer than normal and the chances of complications are greater because the infant must be delivered by instruments. Prolonged and extreme maternal stress during the period of the foetus frequently causes more illness during the first three years of the child's life than is experienced by children who had a more favourable foetal environment.

There is evidence that many unfavourable attitudes towards children, begin to develop when their potential arrival becomes known to parents, siblings, relatives and neighbours. If the child is not wanted, or at least, not wanted at this time, attitudes unfavourable from then start. A father-to-be may blame his wife for being careless and make her feel guilty about not preventing the pregnancy. This will lead to marital friction and resentment toward the child when it is born. Therefore, a couple should always seek appropriate counselling, both when the foetus is developing and when child is born.

Conclusion

In this chapter, you were familiarized with the female reproductive system. We discuss the changes that take place in the female on the onset of adolescence, and how these changes trigger off the functioning of the female reproductive system.

The reproductive system of a female can be classified into the external organs and internal organs. The external genitalia or the 'vulva' include the clitoris, labia majora, labia minora and the urethra. The clitoris is an organ for attainment of sexual pleasure. The labia majora protect the clitoris, the urethra and the vaginal openings. The Skene's and Bartholin's glands are located in the labia minora; their secretion during sexual excitement lubricates the entrance to the vagina in preparation for coitus.

You also learnt that the internal organs of the female reproductive system includes hymen, the vagina, the cervix, the uterus, the ovaries and the fallopian tubes. Apart from these, the breasts also have vital functions. The breasts contain milk glands that produce milk and milk ducts that carry the milk to the nipple so that the infant have its feed.

The menstrual cycle is a significant aspect of the reproductive system. We learn that the menstrual cycle is a pattern of fertility and infertility that usually repeats itself each month. You were also acquainted with the female sex hormones estrogens and progesterone. Apart from this knowledge, we went on to discuss the processes and facts associated to pregnancy, fertilization of the ovum by the sperm, determination of the sex of the baby, growth of the child during pregnancy (which include the three important stages of zygote, embryo, and fetus), and delivery of the child. Finally, it is also very important to note that the child needs proper physical

and psychological care, even when in the mother's womb. Therefore, we rounded up this chapter by discussing physical and psychological factors that affect the foetus in the prenatal period.

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