The doctor showed graph for testosterone concentration in plasma during different ages.

You remember we said from week( 8-18) there is high concentration of the testosterone for two reasons :

1. The formation of the male genital organ.
2. For the descending of the testes in the scrotum.

-Testosterone secretion or production under the effect of human chorionic gonadotropinfrom (HCG) of the placenta

-And we said the HCG hormone released or found in the pituitary gland, testes and other placental tissues.

-Testosterone is a prohormone and it is present as a testosterone in the testes, ovary and muscle…but it presents as “estradiol” in : fat , liver , skin , hair , CNS under the effect of the aromatase enzymes, by α reductase produces dihydrotestosterone in the prostate, scrotum, penis and bone…and under the effect of another enzyme "dehydrogenase" ketosteroids, liver and kidney, and conjugated with enzymes of the liver and kidney to be destroyed.

-High concentration of dihydrotestosterone may produce prostate cancer there for if we permit formation of dihydrotestosterone it may produce prostate cancer.

-Dihydrotestosterone is too much active (30-50) times higher that of the testosterone.

-several other tissues including adipose tissue, brain, muscle, skin and adrenal cortex they have testosterone, either themselves produce the hormone or from other sources.

**-methods that prevent or reduce the prostate cancer:**

1-prevent the formation of "dihydrotestosterone" .

2-another method we call it "chemical therapy OR chemical castration" we inject the individual with gonadotropine releasing hormone continuously ,the result reducing in testosterone production consequently dihydrotestosterone…..**BUT HOW??** More and more gonadotropine releasing hormone at the end the LH and FSH concentration decreased this called "receptors desensitization ", again and again gonadotropine releasing hormone then the receptors on the pituitary gland to produce FSH and LH they do not respond."the same as insulin and down regulation".

**PLEASE look at figure 44-6 page 10 in the booklet.**

* **Functions of testosterone:**

1. Intrauterine formation of the male genital organs, the differentiation genetically determined.
2. Imprint male pattern as estradiol as testosterone and dihydrotestosterone.
3. On larynx (male voice).
4. on upper body fat, on muscle mass and on production of the red blood cells...you know that the difference between males and females is because of androgens.
5. On the derivatives of cholesterol "LDL, HDL and VLDL"
6. On sperm production and pubertal development.

Unlike most species which met only to produce offspring, human’s sexual activity and procreation are not tightly related superimpose in the basic reproductive mechanism dictated by hormones are numerous psychological and societal factors, in normal men no correlation is found between circulating testosterone level and sexual drive frequency of intercourse or sexual balances…similarly there is no correlation between testosterone level and impotence or homosexuality…castration of adult men results in slow decline in but not a complete elimination of sexual interest ..in castration there is no sexual activity \*means that: this castrated male cannot has baby ☹\* ((there is a difference between the interest and activity)).

"the male needs normal level of testosterone, above the normal level no any activity increases, BUT below it will affect ".

-The grow and secretory activity of sebaceous gland on the face, upper back and chest are stimulated by androgens, primarily dihydrotestosterone, and inhibited by estrogens ….increase sensitivity of target cells to androgen action specially during puberty and after it..is the cause of "acne valgaris" in both males and females.

**Please look at figure 23-16 page 15**

This figure show the normal sperm which consist of head, middle and tail..in the head there is nucleus which contain the chromosomes "chromosome number 23 is X and Y"…in front of the head there is acrosome contains enzymes lyses the tissue around the ovum..in the middle there is mitochondria and the tail for movement and there are proteins activated by calcium.

-the acrosome contains many enzymes proteolytic enzymes such as hyaluronidase, acrosin, neuraminidase, phospholIpase A and esterases ,, they are inactive until the acrosome reaction occurs in contact with the sperm head with the egg..so they are not activated unless the sperm contact the ovum "not just that enter the ovum, all of the sperms contacted the ovum they release these enzymes".

- the age of puberty in girls 8-30 and it depend on many factors, environmental race and nutritional.

-spermarchy:the first appearance of sperms in the early morning urine occurs at average age 13-14 years old.

**Please look at table 8.10 page 26**

**-the causes of delayed puberty:**

1. Normal variant, this is of two subtypes either familial or racial.
2. Coincidental serious illness like; mumps, fever or tuberculosis.
3. Psychological stresses.
4. Hypogonadism from any cause.
5. Hyperprolactinemia.

**\*two terms you have to differentiate between them :**

Impotence:is the inability of an adult male to hold an erection.

infertile or steril: is the inability to fertilize the ovum.

\*\*impotant is steril but steril is not impotant.

* **Please look at table 8.6 page 28 >> about the Causes of impotence>>exactly as in the slide.**

\*heart diseases also cause impotence specially after surgery.

-impotent does not has an erection .

**\*the doctor show slide about the mechanism of erection, and explain the following:**

Nitric oxide from parasympathetic division activate guanylate cyclase this produces guanosine monophosphate (GMP) from guanosine triphosphate (GTP), GMP decreases cytoplasmic calcium in the penile smooth muscle reductation then the penile muscle become full of blood after sometimes phosphodiesterase enzyme converse GMP to 5GMP this is the normal process, this is the role of "Viagra"….Viagra destroy the phosphodiesterase enzyme to prolong the action of GMP.

-now there is another group of drugs that function similar to the function of Viagra by destroying the phosphodiesterase enzyme.

Please look at pages 68 and 69 ,, the doctor read it.

Viagre takes its sublimity from this point:The indivisual takes Viagra but no erection unless is stimulated."Sildenafil is not an aphrodiasiac and sexual stimulation is essential for its activity."

**\*another important points about Viagra added to that in pages 68,69.**

1-Precautions should be exercised while giving Sildenafil to patients with sever renal ,lung and heart diseases.

2- Sildenafil is indicated in patients taking organic nitrates "some people with heart disease they take this drug,,but sildenafil and Viagra act with these drug and may cause death" or nitric oxide .

3- Sildenafil should not be taken with some anti hypertensive drug >>so when Viagra takes with these hypertensive drugs may Viagra work neither hypertensive drugs work.

\*\*70-80% of peoples who use Viagra are young people.

**Please look at figure 16-16 page 21**

-after the sexual intercourse the sperms reach the fertilization site after one hour maximally, and of these sperms just 0.001 reach the fertilization site, some females suffer from this problem: the sperms does not reach the fertilization site within an hour so we physicians advice them to stay in bed longer.

-the semen contains chemical substances including enzymes, vitamins, proteins….60% from the seminal vesicles 20% from the prostate ,10% sperms and 10% from the other sources.

-hyaluronidase: very important enzyme, is not a product of the accessory glands but its found in the sperm in the acrosome, the secretion of the accessory gland promote sperm survival and fertility.

-when the semen is ejaculated in the female reproductive system coagulate immediately, the coagulum form of the sperms minimizing the expulsion of the sperm from the vagina, after that the semen is liquefied, the liquefaction it has to be completed within 50 minutes so as the sperms to become free to reach the fertilization site.

-the semen is liquefied by enzymes one of them is acid phosphatase.

\*To establish the causes of reproductive dysfunction, vesicle examination, medical history, semen analysis, hormone determinations, hormone stimulation test and genetic analysis.

**SEMEN ANALYSIS**

\*one step of evaluation fertility is semen analysis, semen are analyzed on specimens collected after 3-5 days of sexual "ما سمعتها"

\***table 8.2 >>ANOTHER PAGE IN THE BOOKLET CONTAIN SOMETHING ABOUT THIS POINTS PAGE 20**

1-First they measure the volume of the semen "normally 3-4 ml, ranging from 1-7 ml" normally each ml contain 100 million ((100 million/ml, ranging from 200million to 1200 million)).

2-Then motility: ideal at least 70% of sperms are motile… it may be 10-20% >>this depend on sperms count.

3-Morphology: also normal morphology reach 70%

\*\*the doctor show figure 80-4 about the normal morphology of the sperms.

4-liquefaction: it has to be completed within 50 minutes above half an hour>>infertility.

5-fructose: oligospermia>>low sperm account…azospermia>>no sperms at all.

