NAME: ABOHWO KESSIENA CHISOM.

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DEPARTMENT: PHYSIOLOGY.

1. PRIMARY OBESITY.

Obesity is a medical condition in which excess body fat has accumulated to an extent that it may have a negative effect on health. People are generally considered obese when their body mass index (BMI), a measurement obtained by dividing a person's weight by the square of the person's height, is over 30 kg/m2; the range 25–30 kg/m2 is defined as overweight. BMI is closely related to both percentage body fat and total body fat. In children, a healthy weight varies with age and sex. Obesity in children and adolescents is defined not as an absolute number but in relation to a historical normal group, such that obesity is a BMI greater than the 95th percentile

Obesity is most commonly caused by a combination of excessive food intake, lack of physical activity, and genetic susceptibility. A few cases are caused primarily by genes, endocrine disorders, medications, or mental disorder. The view that obese people eat little yet gain weight due to a slow metabolism is not medically supported.

1. HOW DRUG THERAPY AND CONGENITAL SYNDROME AFFECTS SECONDARY OBESITY.
* HOW DRUG THERAPY AFFECTS SECONDARY OBESITY.

Drugs can aid increase in weight gain in the sense that Some drugs stimulate arcuate nucleus of the hypothalamus causing an increase in appetite and as a result increase in consumption of food.

Obesity is a chronic disease, and it requires chronic therapy. Hypertension, dyslipidemia, diabetes and cardiovascular diseases are leading causes of mortality in the modern world. All of them are strongly linked to obesity. While treating obesity, those conditions are also managed. Obese patients should always be treated through lifestyle interventions, though the results of such interventions are modest. Pharmacotherapy is a second step in the treatment of obesity, approved only when weight loss targets were not reached through lifestyle intervention.

* HOW CONGENITAL SYNDROME AFFECTS SECONDARY OBESITY.

Medical disorders such as Cushing's syndrome, hypothyroidism and hypogonadism rarely cause obesity as well as polycystic ovarian syndrome (PCOS). Genetic factors play a role, but the specific mechanism is unclear.

* HYPOTHYROIDISM.

Body composition and thyroid hormones appear to be closely related. Thyroid hormones regulate basal metabolism, thermogenesis and play an important role in lipid and glucose metabolism, food intake and fat oxidation. Thyroid dysfunction is associated with changes in body weight and composition, body temperature and total and resting energy expenditure (REE) independent of physical activity.

Hypothyroidism is associated with decreased thermogenesis, decreased metabolic rate, and has also been shown to correlate with a higher body mass index (BMI) and a higher prevalence of obesity.

* POLYCYSTIC OVARIAN SYNDROME.

Androgens play an important role in determination of body composition. Independent of BMI, women with PCOS have been reported to have a high prevalence of upper-body obesity as demonstrated by increased waist circumference and waist-hip ratio compared to BMI-matched control women. In post-menopausal women exposure to androgens increases visceral fat in both obese and normal-weight women.

1. AETIOLOGY OF CANCER AND ITS MOLECULAR BASIS.
* AETIOLOGY OF CANCER.

Etiology is the study of causes of a disease. Cancer is neither contagious nor hereditary disease. It is suggested that every living organism has some inactive cancer-causing genes called proto-oncogenes.

What Causes Cancer.

A number of physical, chemical or biological agents are known to mutate and activate these proto-oncogenes into active and cancer causing oncogenes. Due to altered gene activity, normal control mechanism is lost and the abnormal cell growth and cell division take place. The physical and chemical agents, which induce cancer growth, are called carcinogens.

Causes of Cancer.

1. Ionising radiations like X-rays, gamma-rays and particulate radiations from radioactive substances are known to rupture DNA strands and induce mutations to cause cancers e.g., excessive exposure to sunlight may stimulate the development of skin cancer in farmers. Evidence for the carcinogenic effect of X-rays is documented that the incidence of leukemia is about ten times in radiologists than in other physicians. Japanese people exposed to radiations released from World War II nuclear explosions shoved five times the incidence of leukemia than the rest of the population.

2. Physical irritants like certain foods, which cause continued abrasion of the linings of the intestinal tract, are also carcinogenic. Kashmiris use kangri to keep themselves warm but is known to cause abdominal skin cancer due to constant heat exposure.

3. Chemical agents like caffein, polycyclic hydrocarbons, heavy metallic ions etc. are also carcinogenic. Hormones like testosterone and estrogens are known to cause prostate and breast cancer respectively. Chewing of beetles is known to cause mouth cancer. Cigarette and cigar tobacco smoking causes lip, mouth and lung cancers due to presence of a carcinogenic agent, benzpyrene and N-nitroso-dimethylene. An animal protein-rich diet is known to cause cancer of large intestine. Dye workers have a high rate of bladder cancer.

4. Biological agents. Cervix cancer is caused by viruses. Tumour causing viruses e.g. Epstein-Barr virus, Herpes simplex type-2 virus etc. are called oncoviruses.

* MOLECULAR BASIS OF CANCER.

Cancer is a disease of uncontrolled growth and proliferation whereby cells have escaped the body’s normal growth control mechanisms and have gained the ability to divide indefinitely. It is a multi-step process that requires the accumulation of many genetic changes over time. Most cancers result from mutations in somatic cells. Some cancers are caused by mutations in germline cells. In normal tissues, the rates of new cell growth and old cell death are kept in balance, In cancer, this balance is disrupted, This disruption can result from uncontrolled cell growth or loss of a cell's ability to undergo apoptosis.