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DEPT: MEDICINE & SURGERY

ASSIGNMENT

1. What do you understand by primary or simple obesity
2. How does congenital syndrome and drug therapy affect obesity
3. Outline the aetiology of cancer and its molecular basis

ANSWER 1

PRIMARY OBESITY

Primary obesity occurs when the intake of metabolic fuel is greater than the energy expenditure; it leads to excess production of Triacylglycerol (TAGs) which are stored as fats. It is simply obesity due to excess calorie intake with low energy spent. It does not occur due to underlying health issues.

Although primary obesity is not harmful, it significantly increases the risk of contracting diseases, such as: arterial hypertension, dyslipidemia, type 2 diabetes mellitus, coronary heart disease, cerebral vasculopathy, gallbladder lithiasis, arthropathy, ovarian polycytosis, sleep apnea syndrome, and some neoplasms.

ANSWER 2

CONGENITAL SYNDROME AND OBESITY

Leptin is a hormone that is produced by the fat cells of the body. It is often referred to as the "satiety hormone" or the "starvation hormone." Leptin's primary target is in the brain, particularly an area called the hypothalamus. The action of leptin is to signal the brain when there is enough fat stored.

However, the main role of leptin is long-term regulation of energy, including the number of calories an individual eats and expends, as well as how much fat stored in the body. The leptin system evolved to keep humans from starving or overeating.

Hence a situation where there is not sufficient leptin or resistance to leptin can cause obesity:

Congenital leptin deficiency is a condition that causes severe obesity beginning in the first few months of life. Affected individuals are of normal weight at birth, but they are constantly hungry and quickly gain weight. Without treatment, the extreme hunger continues and leads to chronic excessive eating (hyperphagia) and obesity.

THE EFFECT OF DRUG THERAPY ON OBESITY

Obesity is due to unbalance calorific intake. Diet and exercising help against obesity but are only effective over a long period of time. Drug therapy has been introduced to fix obesity on short term.

Medications associated with weight gain

Psychotropic agents, anti-convulsant agent, steroid hormones.

Medications used for weight loss

1. Appetite suppressant; anorectic drugs are used to decrease appetite in obese individuals hence metabolic fuel intake is reduced
2. Digestive inhibitors; there are drugs which prevent the action of gastric and pancreatic lipases. These lipases aid the digestion of triglycerides into free fatty acids.
3. Hormone inductions; The gastrointestinal tract and central nervous system contain several peptides and hormones that regulate feeding behavior. For example, cholecystokinin and serotonin act to decrease appetite and food intake. Conversely, neuropeptide Y increases food intake and decreases energy expenditure. Leptin may limit food intake, decrease plasma insulin and increase energy expenditure. Use of these hormone supplements may help in controlling obesity.

ANSWER 3

AETIOLOGY OF CANCER

Cancer is the uncontrolled growth of abnormal cells anywhere in the body. These abnormal cels are termed cancer cells, malignant cells, or tumor cells. These cells can infiltrate normal body tissues.

Cancer is a result of multifactorial agents; the environment, heredity, mutagens and carcinogens.

These factors may be within the cells or external. Majority of the causes of cancer are the external factors which are within the environment.

In summary, carcinogens either physical or chemical can cause damage to the DNA which in turn causes mutation that result in cancer.

CAUSES OF CANCER

1. **Environment**; the environment consist of both physical and chemical carcinogens which interact with the body cells to cause cancer.
   Physical agents include UV light, gamma rays, X-rays
   Chemical agents include Benzene, Beryllium, asbestos, vinyl chloride, food additives and colouring agents, tobacco.
2. **Cancer genes;** certain genes when altered are very likely to cause cancer. These genes are termed cancer genes. They include; oncogenes, tumour suppressor genes, mismatch-repair genes
   Oncogenes; these genes regulate the normal growth of cells. An alteration in them would lead to abnormal and rapid cell growth leading to cancer
   Tumour suppressor genes; These genes are able to recognize abnormal growth and reproduction of damaged cells, or cancer cells and can interrupt their reproduction until the defect is corrected. If tumor suppressor genes are mutated, however, and they do not function properly, tumor growth may occur.
   Mismatch-repair genes; these genes help to recognize error when DNA is copied to make a new cell. If the DNA does not "match" perfectly, these genes repair the mismatch and correct the error. If these genes are not working properly, however, errors in DNA can be transmitted to new cells, causing them to be damaged.
3. **Hereditary;** mutated genes causing cancers have 50% chance of been passed to offspring because parent passes chromosomes to the offspring. For insance, breast cancer and ovarian cancer run together in families with hereditary breast and ovarian cancer syndrome (HBOC), xeroderma pigmentosa (a skin cancer), familia adenomatous polyposis coli (FAP)(a cancer of the colon)
4. **Hormones;** some cancers are sensitive to hormones and may influence their growth and spread under the influence of the hormone. When a tumor is hormone-sensitive, its cells have proteins on their surfaces called receptors. These receptors bind with hormones and the cancer cell grows and spreads. Most hormones which are cancer sensitive are steroids. Examples of hormone sensitive cancers are;

Breast cancer; which may need estrogen and progesterone to grow
Ovarian cancer; it is affected by estrogen
Uterine/endometrial cancer; it is increase and proliferates in presence of progesterone and estrogen
Prostate cancer; testosterone and similar hormone help its growth and spread