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MBBS 300LVL

BIOCHEMISTRY ASSIGNMENT

QUESTION 1: WHAT DO YOU UNDERSTAND BY PRIMARY OR SIMPLE OBESITY

Primary obesity has been defined simply as a state of excess accumulation of adipose tissue in the body leading to adverse effects on the individual's health. In primary obesity the excess accumulation of fat is as a result of low insulin production of the body or reduced to insulin hormone without any underlying condition. Any underlying condition that leads to weight gain and have a disorder in the weight regulating system of the body is then known as secondary obesity.

QUESTION 2: HOW DOES CONGENITAL SYNDROMES AND DRUG THERAPY AFFECT OBESITY?

Congenital syndromes or disorders are conditions present at birth regardless of its cause. Birth defects may result in disabilities which may be physical, mental, or developmental. The disabilities may range from mild to severe. These congenital syndromes usually result from genetic or chromosomal mutations or aberrations leading to different birth defects and manifestations. Genes can directly cause obesity in in specific congenital disorders such as Bardet-Biedl syndrome and Prada-Willi syndrome. The obesity associated with Prada-Willi syndrome results from a chronic imbalance between energy intake and expenditure leading to hyperphagia, decreased physical activity, reduced metabolic rate and an inability to vomit.

Other non-genetic congenital disorders can also predispose an affected individual to obesity for example 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

Drug therapy is also called pharmacotherapy and is a general term for using medication to treat diseases. Drugs react with receptors or enzymes in cells to promote healthy functioning or cure illness. Some drugs might stimulate ones appetite causing one to eat more and gain extra weight. Other drugs might affect your body's metabolism by slowing the metabolic rate which causes you to burn calories at a lower rate leading to obesity. Drugs such as steroids and some anti-depressants may also cause weight gain. Antipsychotics used in treating schizophrenia and symptoms of psychosis causes weight gain and hyperglycaemia. Prolonged use may lead to insulin insensitivity. Another example is chlorpromazine which has antihistamine activity and increases appetite and is sedating.

QUESTION 3: OUTLINE THE ETIOLOGY OF CANCER AND ITS MOLECULAR BASIS

Cancer is a disease characterized by an autonomous proliferation of neoplastic cells caused by genetic changes leading to uncontrolled cell growth and tumour formation. The basic cause of sporadic cancers is DNA damage and genomic instability. A minority of cancers are due to inherited genetic mutations. Neoplasm is an abnormal mass of tissue, the growth of which exceeds and is uncoordinated with that of normal tissue and persists in the same excessive manner even after cessation of stimuli which invoked the change.

Cellular functions are controlled by proteins, and because these proteins are encoded by DNA organized into genes, molecular studies have shown that cancer is a paradigm of acquired genetic disease. The process of protein production involves a cascade of several different steps, each with its attendant enzymes, which are also encoded by DNA and regulated by other proteins. Most steps in the process can be affected, eventually leading to an alteration in the amount or structure of proteins, which in turn affects cellular function. However, whereas cellular function may be altered by disturbance of one gene, malignant transformation is thought to require two or more abnormalities occurring in the same cell. Although there are mechanisms responsible for DNA maintenance and repair, the basic structure of DNA and the order of the nucleotide bases can be mutated. These mutations can be inherited or can occur sporadically, and can be present in all cells or only in the tumour cells. At the nucleotide level, these mutations can be substitutions, additions or deletions.

These mutations are from agents such as chemicals, radiations, viruses. Which causes a normal cell to have damaged DNA, the DNA could repair itself through stages of the cell cycle. However in cancer the damaged cell does not die or get repaired. Failure of the DNA repair leads to mutations in the genome of somatic cells which would cause;

- Activation of growth promoting oncogenes
- Inactivation of tumor supressing oncogenes
- Alteration of genes that regulate apoptosis

All these leads to unregulated cell division and decreased apoptosis, eventually the damaged cell would increase and proliferate, then tumor progression and malignant neoplasms leading to metastasis of cancer.