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**BIOCHEMISTRY ASSIGNMENT**

**QUESTIONS:**

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

**Answers:**

1. Primary or simple obesity is a medical condition in which excess body fat has accumulated to an extent that it may have a negative effect on health. A person has traditionally been considered to be obese if they are more than 20 percent over their ideal weight. That ideal weight must take into account the person’s height, age, sex, and build. Obesity is often multifactorial, based on both genetic and behavioural factors. Accordingly, treatment of obesity usually requires more than just dietary changes. Exercise, counselling and support, and sometimes medication can supplement diet to help patients conquer weight problems. Extreme diets, on the other hand, can actually contribute to increased obesity.
2. **Aetiology of cancer**

Cancer is a disease caused by genetic changes leading to uncontrolled cell growth and tumor formation. The basic cause of sporadic (non-familial) cancers is DNA damageand genomic instability a minority of cancers are due to inherited genetic mutations. Most cancers are related to environmental, lifestyle, or behavioral exposures.Cancer is generally not contagious in humans, though it can be caused by oncoviruses and cancer bacteria. The term "environmental’’, as used by cancer researchers, refers to everything outside the body that interacts with humans. The environment is not limited to the biophysical environment (e.g. exposure to factors such as air pollution or sunlight), but also includes lifestyle and behavioral factors.

MOLECULAR BASIS

The causes of cancers necessarily involves an examination of the molecular machinery in cells that guides the basic processes of proliferation i.e increase in cell number by cell division, Differentiation i.e cell specialization into different tissue types, And apoptosis, i.e programmed cell death. Those processes are guided by two innate programs in cells, the genetic code and epigenetic code. In cancer each of those codes ultimately becomes altered regardless of whether the disease originated with an external or internal factor. Indeed, a fundamental characteristic of a tumor cell is that it begets a tumor cell. In other words, cancer once manifest, becomes an inherited disease of the cell and is therefore self-perpetuating. The hereditary nature of cancer at the cellular level explains why alterations have been found in both the genetic and epigenetic codes in tumor cells. The number of alterations seen in the coded programs increases as tumors progress to more advanced stages.

1. **How congenital syndrome affects obesity**

Some genetic syndrome involved in obesity includes: Down syndrome, turner syndrome, Cohen syndrome, prader-wili syndrome, and Laurence-moon-biedl (bardet-biedl) syndrome.

The epidemic of obesity is also affecting children with congenital heart disease. Concordance rates for obesity and type 2 diabetes mellitus are higher in monozygotic twins than in dizygotic twins, and measures of total body fat (TBF) correlate nearly as strongly in monozygotic twins reared apart than together. Still, genetic factors cannot explain the increased prevalence of obesity observed among adolescents over the past generation.

It is important to consider that factors present since the children’s conception may contribute to ‘programming’ of disease in adult life. The quality of the mother’s nutrition during pregnancy may affect the fetal metabolism and the child’s taste and attributes towards foot.

**How drug therapy affects obesity**

Anti-obesity medication or weight loss medication are pharmacological agents that reduce or control weight. These medications alter one of the fundamental processes of the human body, weight regulation, by altering either appetite, or absorption of calories.

Using pharmacotherapy for weight management is consistent with treating obesity as a chronic disease that requires a multifaceted approach including behavioural intervention, dietary change, and appropriate medical intervention. Treatment with anti-obesity drugs like tetrahydrolipstatin and serotonin-noradrenaline reuptake leads to weight loss and more importantly, reduction in long-term weight gain.

Some anti-obesity medications can have severe, even lethal side effects, fen-phen being a famous example. Fen-phen was reported through the FDA to cause abnormal echocardiograms, heart valve problems, and rare valvular disease. Another medication, orlistat, blocks absorption of dietary fats and as a result may cause oily spotting bowel movements, oily stools, stomach pain and flatulence,.