**DIABETES, OBESITY AND CANCER**

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**Question**

1. WHAT DO YOU UNDERSTAND BY PRIMARY OR SIMPLE OBESITY

2. HOW DOES CONGENITAL SYNDROME AND DRUG THERAPY AFFECTS OBESITY

3. OUTLINE THE AETIOLOGY OF CANCER AND ITS MOLECULAR BASIS.

**ANSWERS**

1. WHAT DO YOU UNDERSTAND BY PRIMARY OR SIMPLE OBESITY

Primary or simple obesity is a nutritional disorder in which excess fat is accumulated in the body. It occurs when intake of metabolic fuel is consistently greater than energy expenditure, which further causes excess triacylglyceride production and increase in number and size of adipocytes. In primary obesity, the body mass index (BMI) is 25.9-30.9 above this is secondary obesity.

2. HOW DOES CONGENITAL SYNDROME AND DRUG THERAPY AFFECTS OBESITY

Obesity occurs in several multiple congenital syndromes, including Prader-Willi syndrome, Bardet-Biedl syndrome, Cohen syndrome, Albright hereditary osteodystrophy, and Borjeson-Forssman-Lehmann syndrome as well as some rarer disorders. Although hypothalamic-pituitary axis abnormalities are thought to be a possible causative mechanism in some of these disorders. The chromosomal location of many of these syndromes is known, and studies are ongoing to identify the causative genes. Further obstructions in the functions of the underlying genes will likely be instructive regarding mechanisms of appetite, satiety, and obesity.

Drug therapy also plays an important complementary role in an integrated strategy for managing obesity. As a method of losing weight and maintaining weight loss, calorie-restricted diets are proving ineffective and counterproductive. The central nervous system properties of the amphetamines have led to chemical alterations of the original molecule in the hope of creating an appetite-suppressant drug without the potential risk for abuse, studies also demonstrate that serotonergic drugs can induce weight loss in the short term and in some cases also the long term.

3. OUTLINE THE AETIOLOGY OF CANCER AND ITS MOLECULAR BASIS.

Cancer is caused by two main factors:

1. Hereditary Mutation
2. Environmental Factors

**Hereditary Mutation:** These are less common. A germline mutation occurs in a sperm cell or egg cell. It passes directly from a parent to a child at the time of conception. As the embryo grows into a baby, the mutation from the initial sperm or egg cell is copied into every cell within the body. Because the mutation affects reproductive cells, it can pass from generation to generation. Cancer caused by germline mutations is called inherited cancer. It accounts for about 5% to 20% of all cancers. Mutations happen often. A mutation may be beneficial, harmful, or neutral. This depends where in the gene the change occurs. Typically, the body corrects most mutations.

A single mutation will likely not cause cancer. Usually, cancer occurs from multiple mutations over a lifetime. That is why cancer occurs more often in older people. They have had more opportunities for mutations to build up.

**Molecular Basis:**

Types of genes linked to hereditary mutations are Tumor suppressor genes. These are protective genes. Examples of tumor suppressor genes include BRCA1, BRCA2, and p53 or TP53. Germline mutations in BRCA1 or BRCA2 genes increase a woman’s risk of developing hereditary breast or ovarian cancers and a man’s risk of developing hereditary prostate or breast cancers. They also increase the risk of pancreatic cancer and melanoma in women and men. The most commonly mutated gene in people with cancer is p53 or TP53. More than 50% of cancers involve a missing or damaged p53 gene. Most p53 gene mutations are acquired. Germline p53 mutations are rare, but patients who carry them are at a higher risk of developing many different types of cancer.

**Environmental Factors:** This includes the Carcinogens found in the environment. Physical carcinogens includes, x-ray, u/v light, gamma rays etc. Chemical Carcinogens includes, aniline, tobacco, asbestos, food additives, coloring agents etc. Natural Carcinogens includes Aflatoxin B (found in molds of fungus).