BIOCHEMISTRY ASSIGNMENT

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LEVEL: 300 LEVEL

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MATRIC NUMBER: 17/MHS01/003

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

QUESTION 2: HOW DOES CONGENITAL SYNDROME AND DRUG THERAPY AFFECT OBESITY

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

1. Primary exogenous obesity has been defined simply as a state of excess adipose tissue in the body and is not related to any clinical condition.

Excess adipose tissue is difficult to quantify, obesity is present when fat content exceeds 25\

percent of body weight in males and 30 percent in females.

1. Effect of congenital syndrome on obesity

congenital disease or birth defects are conditions present in death regardless of condition, these include: fragile x syndrome, down syndrome, prader willi syndrome, layrence moon-bardet syndrome and so on. These diseases exhibit certain characteristics which are known as symptoms. Some congenital diseases present obesity as a symptom. An example of this is the prader willi syndrome,children with the prader willi syndrome present a lower metabolic rate than normal and have a constant sense of hunger.

Metabolism is defined as the series of chemical reaction in a living organism that create and breakdown energy necessary for life. More simply, it is the rate at which the body expends energy or burns calories.

An individual with low metabolism will burn fewer calories at rest and during activity as such that individual needs to eat less to prevent being overweight.

In prader willi syndrome, one of the symptoms is constant hunger which results in compulsive eating and as a result of their slow metabolic rate they become overweight . This is not always the case for congenital diseases that present obesity as a symptom.

Some congenital diseases and why they present obsesity as a symptom include:

* PRADER WILLI SYNDROME: People with this disorder become obese as a result of mental disorder that will result to overreacting which together with their slow metabolic rate will lead to obesity.
* LAWRENCE-MOON-BARDET SYNDROME: people with this disorder become obese as result of leptin resistance in fat cells, because the adipocytes do not respond to leptin, they continue to increase in number and lead to obesity.
* Down syndrome: Obesity in down syndrome occurs due to the same reason as that of Lawrence-moon-bardet syndrome.
* Pseudohypoparathyroidism: People with this disorder become obese asa result of leptin deficiency
* Turner syndrome: People with this disorder become obese as a result of insulin resistance. Excess insulin, due to insulin resistance can lead to weight gain and eventually obesity.
* Cohen syndrome: People with this disorder become obese as a result of increased response of adipocytes to insulin.

EFFECT OF DRUG THERAPY ON OBESITY

Medication such as antidepressants, antipsychotic, diabetes medication and generally drugs in class known as thiazolidinediones (TZD’S) can lead to weight gain and an increase in fat. This eventually will result in obesity. As in the case of congenital diseases, how these drugs will produce obesity is different.

Thiazolidinediones are oral anti-diabetic drugs that act as insulin sensitizers, they improve glycemic control and inulin sensitivity in patients with type 2 diabetes, despite their potential to cause weight gain. Studies haveattempted to elucidate the mechanisms behind the apparent paradox of TZD’S improving insulin sensitivity while causing weight gain. Data indicates that with TZD treatment, there is favorable shift in fat distribution from visceral to subcutaneous adipose depots that is associated with improvents in hepatic and peripheral tissue sensitivity to insulin. Although weight gain may occur with TZD therapy. It is not inevitable.

Experts do not fully understand why antidepressants lead to weight gain in certain individuals, one theory is that both metabolism and hunger levels may be affected. Antidepressants interfere with serotonin, the neurotransmitter that regulates anxiety and mood while also controlling appetie. In particular these changes may increase cravings for carbohydrate-rich foods such as bread, pasta and desserts.

Depresssion can also cause weight gain but some others lose weight, when people are depressed their appetites are affected. In some people , this may make them hungrier while others lose their appetite. It may be the case when antidepressants take effect and appetite returns which which have an impact on their weight.

1. The ethiology of cancer is multifactorial meaning cancer can arise from various factors ranging from physical, chemical, environmental factors including genetic mutations. It also includes hormonal, metabolic factors as well. These aforementioned factors lead to genetic mutation and then cancer.

Carcinogens or cancer causatives are mutagens and vice versa as such any carcinogen that is physical or chemical can cause DNA damage which leads to mutation and mutation causes cancer. There are DNA repair genes that fix errors in DNA replication but in cases where these repair genes are deleted it results in about 50% of cancers. These DNA repair genes are called antioncogene or oncosuprresor gene.

Some of the causes of cancer include:

* physical such as UV rays, Xrays, gamma rays etc.
* chemical carcinogens such as tobacco that contains benzokynine, nicotine and carbaminooxide.
* Food additives and chemical agents
* Natural chemicals including- Aflatoxin B found in fungi
* Hormones such as steroid hormone
* mutated gene that causes cancer inherited by offspring such as xeroderma pigmentosa, familial adenomatosis polyposis.
* Oncogenic viruses or oncoviruses- these are introduced into the DNA of the host and the cause the multiplication of the viral gene which overtakes the cells of the host causing an uncontrolled multiplication of cells

Some of these oncogenic viruses include:

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| VIRUS | ABBREVIATION | ASSOCIATED CANCER |
| EPSTEIN-BARR VIRUS | EBV | NASOPHARYNGEAL CARCINOMA  BURKITTS LYMPHOMA |
| HEPATITIS B VIRUS | HBV | HEPATOMA OR HEPATOCELLULAR CARCINOMA |
| HUMAN PAPILLOMA VIRUS | HPV | UTEROCERVICAL CARCINOMA |
| HUMAN IMMUNODEFICIENCY VIRUS | HIV | KAPOSIS SARCOMA  NON-HODGKINS LYMPHOMA |