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17/MHS01/311

MEDICAL BIOCHEMISTRY

04-05-20

**1. Primary or simple obesity:**

What I understand by primary obesity is, its a complex disease involving an excessive amount of body fat. It also increases the risk of other diseases or health problems like heart diseases, diabetes, high blood pressure and certain cancers to develop. In this situation it may be caused by combination of inherited factors, environment and personal diet. It occurs when you take in more calories than you burn through exercise or normal activities.

**2. Effects of congenital syndromeand drug therapy on obesity**

Effects of congenital syndrome on obesity.

Many congenital abnormalities have caused undernutrition and malnourishment especially in infants and children. Interventions come in place to improve the situation. This causes obesity when not managed properly. These interventions often include consumption of increased calories and foods with high fat and sodium content. Things may change as the infants and children grow and their abnormalities traeted. If not properly managed they may not be able to change from the lifestyle introduced to them earlier and this may lead to more severe problems.

Effect of drug therapy on obesity.

Obesity is a chronic disease that requires chronic therapy. It is treated through lifestyle interventions like exercise controlled apetite and diet. When the targets are not met through these approaches, Drug therapy or Pharmacotherapy is the next step. This is the use of any substance than food to treat, prevent, diagnose, or relieve symptoms of a disease or abnormal condition. Many of these drugs have been withdrawn because of their side effects.

Orlistat: The only survivor from the pre-2010 era is orlistat (marketed as Xenical), an intestinally active lipase inhibitor, which reduces absorption of fat by 30 %. Pooled estimates from long-term studies indicate sustained weight loss of 2.9 % over placebo when given at the standard dose of 120 mg three times daily. Reduced progression to diabetes and improved glycaemic control in patients who already have diabetes have also been noted. Fat malabsorption can give rise to side effects, including oily stools, faecal urgency and spotting if patients continue to consume a diet rich in fat, but these can be avoided with appropriate dietary restraint. Indeed, it is hypothesized that the effectiveness of orlistat likely reflects enforced dietary changes rather than a direct reduction in calorie absorption.

Lorcaserin

In 2012, lorcaserin (Belviq) was the first new anti-obesity agent to be granted an FDA licence for long-term weight management. Like fenfluramine, lorcaserin stimulates 5-HT (serotonin) receptors on anorectic POMC neurons. However, it was developed as a selective agonist of the 5-HT2C receptor to avoid 5-HT2B-mediated valvulopathies, which afflicted the earlier agent. In phase 3 trials, lorcaserin achieved average weight loss of 3.0–3.6 % better than placebo [50, 51], with 2.3 times as many patients losing at least 5 % body weight in the treatment groups. Glycaemic improvements to the tune of a 0.5 % reduction in glycosylated haemoglobin (HbA1c) were seen in patients with type 2 diabetes [52]. Lorcaserin is well tolerated by most patients, with few withdrawals during phase 3 trials due to adverse events. It is currently not clear, however, whether long-term use of lorcaserin has the potential to cause valve abnormalities, despite selectivity for 5-HT2C receptors.

**3. Etiology of cancer and its molecular basis**

Etiology is the cause, set of causes or manner of causation of a disease or condition.

All cancers are multifactoral and these factors cause mutation of gene during replication.

Factors.

1. Genetic

2. Hormonal

3. Metabolic

4. Physical

5. Chemical

6. Environmental

The cells of the body under mutations which turn them into cancerous cells. This could be done through mutagens; physical or chemical agent that changes genetic material of an organism and increases the frequency of mutations above natural level. Carcinogens also cause cancer. Carcinogens are substances capable of causing cancer in tissue.

Causes of cancer.

1. Physical carcinogens: X-rays, UV light, Gamma rays.

2. Natural carcinogens: latoxin B.

3. Chemical carcinogens: Abestors, tobacco, nicotineaniline, food additives, coloring agents, aflatoxins.

4. Hormones: steroid hormones.

5. Hereditary: mutated genes have 50% chance of being passed to an offspring. Example of genes: Xerodermal pigmentosa, Famedial adenomatons Polypsis.

6. Oncogenic viruses: Epstein-Barr Virus, Hepatitis-B, Human Papiloma Virus, Human Immuno Deficiency Virus.

Molecular basis of Cancer

Normal cells replicate and old ones need to be replaced by new ones. Sometimes the cells in our body need to undergo apoptosis- shortening of telomeres on the chromosomes in normal cells. It is a normal cycle in normal cells but in cancerous cells it does not exist due to the enzyme; Telomere Polymerase that lengthens the telomeres and apoptosis is avoided. Cancer cells ignore the signal to stop dividing, die and shed. In a cancer cell there are several gene mutations but there a two general ones:

**>.** Dominant mutation: caused by abnormality in one gene pair. This gene is refered to as the oncogene. It is active and expressive.

**>.** Recessive mutation: when both genes in a pair are being damaged. It is called an antioncogene/tumor supressor gene.

Abnormal cell division could also be caused by viruses which get integrated into the host DNA and start multiplying and overtaking that of the normal cells.